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DOMESTIC MEDICINE
AND HYGIENE.

IN PREPARATION.

**DISEASES AND MANAGEMENT OF
CHILDREN.**

By DR. A. J. GORE, L.R.C.P.,
LONDON, ETC., ETC.

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DOMESTIC MEDICINE AND HYGIENE.

*BEING A SHORT ACCOUNT OF THE MORE COMMON
DISEASES, THEIR CAUSES AND TREATMENT,
WRITTEN IN PLAIN LANGUAGE.*

BY
WILLIAM J. RUSSELL, M.B.

"Life is short, art is long; the occasion fleeting, experience
delusive, and judgment difficult."—HIPPOCRATES.

THIRD EDITION.

REVISED TO THE LATEST MEDICAL PRACTICE.

*Adopted by the Department for Indian Affairs for use throughout
Canada, many of the Principal Nursing Institutions, etc.*

LONDON :

W. H. EVERETT & SON, SALISBURY SQUARE, FLEET ST

EDINBURGH : E. & S. LIVINGSTONE, 15, TEVIOT PLACE.

DUBLIN : FANNIN & CO., GRAFTON ST.

UNITED STATES : THE INTERNATIONAL NEWS CO., NEW YORK

CANADA : TORONTO NEWS CO., TORONTO.

AUSTRALIA : GORDON & GOTCH, MELBOURNE, SYDNEY, AND
BRISBANE.

INDIA : THACKER, SPINK & CO.

CAPE OF GOOD HOPE : J. C. JUTA.

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Ottawa, 3rd June 1857.

Sir:-

I beg to request that you
would be good enough to forward
to the Department of Indian Affairs,
Ottawa, Canada, thirty six (36)
copies of Dr W. J. Russell's
Handbook of Medicine, which
I observe from the title page
can be obtained from you for
two shillings per copy.

I have the honor to be,
Sir,

Your obedient
servant

W. A. Everett, Esq., Deputy Supt General
London, England of Indian Affairs

PREFACE.

THE design of this work is to give a short but accurate account of the principal diseases, their cause, nature, marks by which they are known, and treatment, preventive and curative, in plain language as free from technical terms as possible, so as to form a guide for those compelled to rely on their own resources.

At present there seems to be no simple reliable handbook of medicine for ordinary use; most of the smaller books upon medicine being written for professional men, and abounding in technical terms which convey information more accurately, but, despite glossaries, are a stumbling-block to non-professional readers. In this work many obscure and exceptional diseases, and uncommon manifestations of ordinary diseases, are purposely omitted, though some are described which are difficult to recognise and treat, in order to help persons who

may be called upon to do not the best, but the best they can, for some friend or relative.

Where opinion is divided as to the best among several treatments, to avoid confusion, as a rule, only one is given—that which is best in the judgment of the author.

In all severe illness and obscure diseases, skilled medical attendance should be had if at all possible, as no amount of care or written description will make up for lack of training and practical experience; but in mild cases of many common diseases, it is quite possible for any person of average intelligence to treat them satisfactorily by aid of written instructions; and even when medical attendance is available, the patient and his nurses, by having an intelligent idea of what is aimed at, may be able to render important assistance and avoid mistakes.

When, from distance or any unavoidable cause, medical attendance cannot be had, it is hoped that a careful study of this book, by showing what to do, may in some measure make up the loss, and in large families where there are perpetual little ailments, it will be found of constant use.

It may be well here to caution the reader against adopting active treatment in any case where he does not see before him a definite object to be

accomplished. It requires a good deal of courage on the part of the patient and his attendants to abstain from doing anything till they see a reason why, but this is much safer than haphazard treatment with large doses of potent remedies. A mustard poultice over the seat of pain or a single dose of castor oil will often do good, and very rarely do harm, and a warm bath is usually a safe and good plan of treating an ailing child.

When no very clear indications for treatment are perceived, small doses of drugs such as ipccacuanha or solution of acetate of ammonia, which induce perspiration, are often of great use, and are not likely to do harm. And if the case be chronic, moderate doses of tonics, such as citrate of quinine and iron, or infusion of calumba, may be tried till further light is obtained. It is to be remembered that in all acute disease there is a strong natural tendency to recovery, and that the office of medicine is merely to assist nature and remove hindrances.

To recognise any disease find where pain is complained of, or any very obvious deviation from the natural standard is seen, *e.g.*, very rapid breathing; then turn to the table of contents, where diseases will be found grouped in systems beginning at the head and from the centre, compare the diseases of

the group or system together, and see which resembles the case in question. In the instance of rapid breathing, turn to Group II., Diseases of the Lungs. It should be remembered that the whole of the symptoms described under any disease are not to be expected in every case, nor should surprise be excited by the appearance of unmentioned symptoms. Nature does not keep by hard and fast lines, and as no one case precisely resembles another in every detail of circumstances and symptoms, a typical description is all that can be given.*

The doses given are those for adults, except where otherwise specified. Before giving any drug as recommended under the several diseases, read the account of its effects and any necessary precautions, given in the MATERIA MEDICA. A few tests and microscopic characters are given in diseases affecting the urine, for the benefit of those having an elementary knowledge of chemistry and the microscope.

Those wishing to consult text-books of medicine for a fuller account of what is at present known of disease are recommended for a connected and

* Most cases of continuous ill-health, where there are no very well defined symptoms, are due to disorders of the digestive system, the account of which should therefore be read first in cases of doubt.

scientific view of disease to "A Text-book of Practical Medicine," by Felix von Niemeyer; for the best practical work on medicine in the English or any other language, to "The Science and Practice of Medicine," by William Aitken, M.D., Professor in the Army Medical School; for prevention of diseases, to "A Handbook of Hygiene," by George Wilson, M.D., which is written in an easy style, and for the most part can be understood by any intelligent person, an observation which does not apply to the first two mentioned.

Since the publication of the First Edition, the work has been twice carefully revised, such corrections and additions as were rendered necessary by lapse of time being made.

The chapter on Influenza has been entirely rewritten from experience of the late epidemics, and that on Cholera almost entirely so, special attention being paid to preventive measures.

LONDON, *March* 1893.

CONTENTS.

LIST OF TABLES THROUGHOUT THE BOOK.

TABLES OF DIFFERENCES BETWEEN

PART I.	PAGE
Chicken-pox and small-pox	42
Measles and scarlet fever	47
Typhus and typhoid fevers	53
Eruption of typhus and typhoid fevers	60
Malarious and true yellow fevers	69
Croup, diphtheria, and scarlet fevers	72
Relapsing fever, typhus and typhoid fevers	74
Infections of various fevers	90
Relapsing fever, yellow and malarious fevers	93
Gout, rheumatism, and osteo-arthritis	112
Purpura and scurvy	124

PART II.

Vomiting from brain and from stomach	136
Disease of brain from its membranes	137
Acute and spurious hydrocephalus	143
Acute hydrocephalus and infantile remittent fever	143
Stupor of apoplexy, concussion, opium, and intoxication	152, 153
Wasting palsy and locomotor ataxy	162
Facial paralysis and paralysis from apoplexy	164
Child-crowing and croup	180
Hysteria and epilepsy	188
Palpitation from the heart and from the stomach	230
Bleeding from the lungs and stomach	306
Inflammation and colic	321

TABLES OF SYMPTOMS.

Small-pox	37
Typhoid fever	56, 57
The eruptive fevers	62
Non-eruptive fevers	88
Ague	96
Bright's disease	345
Skin affections	369-372

PART II.

LOCAL DISEASES

Are those which attack particular parts or organs of the body, and are often accompanied by constitutional symptoms.

CHAPTER I.

Diseases of the Nervous System.

Introduction pp. 129-136

GROUP I.—DISEASES OF THE BRAIN AND ITS MEMBRANES, pp. 137-153.

Inflammation of the brain and membranes, or encephalitis.	Sunstroke.
Inflammation of the membranes, or meningitis.	Water on the brain, or chronic hydrocephalus.
Water brain fever, or tubercular meningitis.	Hypertrophy, atrophy, and tumours of the brain.
Inflammation, softening, and abscess of the brain.	Apoplexy.

GROUP II.—DISEASES OF THE SPINAL CORD AND ITS MEMBRANES, pp. 153-156.

Inflammation of the membranes of the cord	Spinal hæmorrhage.
Inflammation of the spinal cord, or myelitis.	Spina bifida (in infants).

GROUP III.—DISEASES OF THE NERVES, pp. 157-166.

Paralysis, or palsy.	Infantile paralysis.
Paraplegia.	Facial paralysis.
Paralytic stroke, or hemiplegia.	Shaking palsy.
Locomotor ataxy.	Writers' cramp.
Wasting palsy.	Glosso-laryngeal paralysis.

GROUP IV.—FUNCTIONAL DISEASES OF THE NERVOUS SYSTEM, pp. 166-192

Tetanus, or lockjaw.	Child-crowling.
Epilepsy, or falling fits.	Migrains.
Hysteria.	Sciatica.
Neuralgia.	Intercostal neuralgia.
Tic douloureux.	Irritable breast.
Chorea.	Cramp or spasms.

GROUP V. — DISORDERS OF THE INTELLECT, pp. 192-199.

Mania, or raving madness.	General paralysis of the
Melancholia.	insane.
Dementia.	

CHAPTER II.

Affections of the Eye.

Introduction pp. 200-203

GROUP I.—AFFECTIONS OF THE CONJUNCTIVA, pp. 203-210.

Ophthalmia, catarrhal.	Ophthalmia, pustular or
Ophthalmia, purulent.	strumous.

GROUP II. AFFECTIONS OF THE CORNEA, IRIS, AND CRYSTALLINE LENS, pp. 211-215.

Inflammation of the cornea.	Iritis.
Ulcers of the cornea.	Cataract.
Foreign bodies in the eye.	

GROUP III.—CHANGES IN THE SHAPE AND POWER OF THE EYE AND FUNCTIONAL DISEASES, pp. 215-219.

Short sight.	Squinting.
Long sight.	Night blindness.
Weak sight.	Colour blindness.
Astigmatism.	

GROUP IV.—DISEASES OF THE EYELIDS, pp. 220-221.

Inflammation of the edge of the lids.	Inverted eyelashes.
Sty.	Bruises.

CHAPTER III.

Diseases of the Ear, pp. 222-224.

Introduction.

Earache.	Inflammation of the inner ear.
Inflammation of the external ear.	Running from the ear.
	Bleeding from the ear.

CHAPTER IV.

Diseases of the Circulatory System.

Introduction	pp. 225-227
GROUP I.—AFFECTIONS OF THE HEART, pp. 227-231.	
Inflammation of the pericardium and endocardium.	Breast pang, or angina pectoris.
Disease of the valves and hypertrophy.	Palpitation.
GROUP II.—DISEASES OF THE BLOOD VESSELS, pp. 231-235.	
Atheroma.	White or milk leg.
Aneurism.	Varicose veins.
Inflammation of veins.	
GROUP III.—DISEASES OF THE BLOOD GLANDS, pp. 235-237.	
Goitre.	Waxy spleen.
Exophthalmic goitre.	Addison's disease.
Enlarged spleen, or ague-cake.	

CHAPTER V.

Diseases of the Lungs and Air-passages.

GROUP I.—THE NOSTRILS AND WINDPIPE, pp. 238-249.	
Catarrh.	Sore throat.
Cold in the head.	Ulcers and dropsy of the windpipe (œdema glottidis).
Ozaena.	Croup.
Bleeding from the nose.	
GROUP II.—THE LUNGS, pp. 249-282.	
Introduction	pp. 249-252
Hay asthma.	Bleeding from the lungs, or hæmoptysis.
Bronchitis, acute and chronic.	Inflammation of the lungs, or pneumonia.
Bronchiectasis.	Consumption.
Asthma.	Plenrisy, acute and chronic.
Emphysema.	

CHAPTER VI.

Diseases of the Digestive System.

GROUP I.—AFFECTIONS OF THE MOUTH AND GULLET,
pp. 283-289.

Inflammation of the mouth.	Quinsy.
Toothache.	Chronic inflammation of
Gumboil.	tonsils.
Inflammation and ulcers of	Inflammation of the throat
the tongue.	and gullet.
Cracked tongue and ranula.	

GROUP II.—AFFECTIONS OF THE STOMACH, pp. 289-
303.

Indigestion, or dyspepsia.	Vomiting of blood from the
Inflammation of the stomach.	stomach.
Chronic ulcer of the stomach.	Cancer of the stomach.

GROUP III.—AFFECTIONS OF THE BOWELS, pp. 309-
331.

Inflammation of the bowels.	Colic.
Biliousness.	Constipation.
Dysentery.	Worms.
Bleeding from the bowels.	Piles.
Diarrhoea.	Prolapse of the bowel.

GROUP IV.—AFFECTIONS OF THE LIVER, pp. 332-
337.

Abscess, atrophy, and cir-	Congestion of the liver.
rhosis.	Jaundice.
Waxy liver, hydatids, fatty	Gall stones.
liver, cancer, and tubercle.	

GROUP V.—AFFECTIONS OF THE MEMBRANE (PERI-
TONEUM) AND GLANDS OF MESENTERY, pp. 338-
341.

Peritonitis.	Tabes mesenterica, or con-
Ascites, or dropsy of the	sumption of the bowels.
belly.	

CHAPTER VII.

Diseases of the Urinary System, pp. 342-353.

N.B.—Venereal diseases are given in an appendix published separately.

Urinary sediments, or gravel.	Blood in the urine, or hæmaturia.
Uric or lithic, phosphatic and oxalic acid diatheses.	Suppression, retention, and incontinence of urine.
Stone in the kidney, or kidney eolie.	Inflammation of the bladder.
Bright's disease.	Stone in the bladder.
Inflammation of the kidney.	The urine.

CHAPTER VIII.

Diseases of the Skin.

GROUP I.—NON-INFECTIOUS DISEASES, pp. 354-365.

Erythema.	Rupia.
Nettle rash, or urticaria.	Eczema.
Lichen.	Eethyma.
Red gum.	Aene.
Prurigo.	Corns.
Psoriasis, or lepra.	Bunions.
Ichthyosis.	Warts.
Herpes.	Freckles.
Shingles.	Boils.
Pemphigus.	Chilblains.

GROUP II.—INFECTIOUS SKIN DISEASES, pp. 365-368.

Ringworm.	Liver spots.
Favus.	Itch.
Bald spots.	

GROUP III.—VERY RARE DISEASES, pp. 368-372.

Molluscum.	Comparative tables of rashes.
Keloid.	„ „ vesicles.
Comparative tables of pimples.	„ „ pustules.
„ „ scales.	„ „ scalp diseases.

PART III.

CHAPTER I.

**Diseases and Management of Children, pp.
373-385.**

N.B.—Diseases of Women are given in a separate publication.

SECTION I.—MANAGEMENT, pp. 373-379.

Cleanliness.
Clothing.
Diet.

Sleep.
Teething.

SECTION II.—DISEASES, pp. 380-385.

Chafing.
Convulsions.
Cries.
Diarrhoea.
Flatulence.

Gripping.
Red gum.
Thrush.
Vomiting.

CHAPTER II.

Old Age and Degenerations, pp. 386-387.

CHAPTER III.

Local Injuries and Emergencies, pp. 388-399.

Abscess or gathering.
Bleeding.
Bruises.
Burns and scalds.
Choking.
Cuts.
Dislocation and fractures.

Fainting.
Insensibility : *see* Index.
Sea Sickness.
Sprains.
Whitlow.
Wounds.
Drowning.

CHAPTER IV.

Poisons : their Effects and Treatment.

SECTION I.—CHRONIC POISONING, pp. 400-406.

Group I.—Organic Poisons, pp. 400-402.

Alcohol.
Digitalis.

Ergot.
Strychnine.

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309.

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Dysentery.
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Constipation.
Worms.
Piles.
Prolapse of the bowel.

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Gall stones.

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Penphigus.	Chilblains.

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CHAPTER I.

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Diet.

Sleep.
Teething.

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Chafing.
Convulsions.
Cries.
Diarrhoea.
Flatulence.

Griping.
Red gum.
Thrush.
Vomiting.

CHAPTER II.

Old Age and Degenerations, pp. 386-387.

CHAPTER III.

Local Injuries and Emergencies, pp. 388-399.

Abscess or gathering.
Bleeding.
Bruises.
Burns and scalds.
Choking.
Cuts.
Dislocation and fractures.

Fainting.
Insensibility : *see* Index.
Sea Sickness.
Sprains.
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Wounds.
Drowning.

CHAPTER IV.

Poisons : their Effects and Treatment.

SECTION I.—CHRONIC POISONING, pp. 400-406.

Group I.—Organic Poisons, pp. 400-402.

Alcohol.
Digitalis.

Ergot.
Strychnine.

Group II.—Inorganic Poisons, pp. 403-406.

Antimony.	Iodine.
Arsenic.	Lead colic and palsy.
Brassfounders' ague.	Mercury.
Chromates.	Phosphorus.
Copper colic.	Nitrate of silver.

SECTION II.—ACUTE POISONING, pp. 406-417.

GROUP I.—Inorganic poisons (with gases and vegetable acids), pp. 407-412.	{	Acids, mineral
		" vegetable
		Alkalies
		Metals
		Minerals
GROUP II.—Organic poisons— Vegetables, pp. 412-416	{	Convulsives
		Deliriants
		Depressants
		Inebriants
		Irritants
GROUP III.—Animal poisons, pp. 416-417	{	Narcotics
		Cantharides
		Poisonous Fish
		Stings and Bites

CHAPTER V.

Materia Medica, pp. 418-462.

Introduction pp. 418-421

Doses for different ages (com- parative table).	{	Weights and measures. Time of administration.
--	---	--

SECTION I.—EXTERNAL REMEDIES AND APPLIANCES,
pp. 421-440.

Antiseptics.	Gargles.
" vapours.	Leeches.
" liquids.	Liniments.
" solids.	Lotions.
Baths.	Ointments.
Bleeding.	Other external applications.
Blisters.	Poultices.
Cupping.	Subcutaneous injection.
Foeds.	Tapping.

SECTION II. -INTERNAL REMEDIES ARRANGED ALPHABETICALLY, WITH THEIR CHIEF EFFECTS, PREPARATIONS, DOSES, AND NECESSARY PRECAUTIONS, pp. 440-456.

SECTION III.—REMEDIES ARRANGED ACCORDING TO THEIR EFFECTS, pp. 456-462.

Acids.	Depressants.
Alkalies.	Diaphoretics.
Alteratives.	Diuretics.
Anæsthetics.	Emetics.
Anodynes.	Expectorants.
Antacids.	Narcotics.
Antipyretics.	Purgatives.
Antispasmodics.	Sedatives.
Anthelmintics.	Soporifics.
Astringents.	Stimulants.
Carminatives.	Sudorifics.
Demulcents.	Tonics.

DOMESTIC MEDICINE

AND

HYGIENE.

INTRODUCTION.

(First read the plan of the book in the Table of Contents.)

SOME of the theories in this work are not accepted by all physicians, and they are not upheld as being ultimately infallible, but in all cases they are useful as giving an intelligent understanding of the subject and enabling us to apply our knowledge of the facts to the best advantage.

The facts are strictly accurate, and are final : thus a faithful account of the signs and symptoms of small-pox or ague in the time of the Romans would be exactly the same as such an account in the present day, in both cases being descriptions of unchanging facts ; but our interpretation of these facts and consequent treatment would be widely different.

The treatments recommended are the best known up to the present time. Most of them have been personally tried by the author in a tolerably extensive practical experience, and, when not so tried, they have been taken from standard authorities.

As prevention is proverbially better than cure, the following short advice for the preservation of health will appropriately precede the account of diseases. The Treatment of Children is given at page 373.

Food.—The meals should be at regular intervals, as a general rule three times a day, and no food taken between them, to allow the stomach intervals of rest.

At the usual time for meals the stomach becomes active, and if this time be passed, food is not so readily digested and should be taken in less quantity; to avoid thus causing it double work we should not vary the time of our daily meals.

The food should be well cooked and changed from time to time to avoid monotony causing disgust and bad digestion. The food should be well chewed and eaten slowly, and some time, say half an hour, allowed to elapse after a meal before doing work.

More food is required when doing work than at rest, and the harder the work the more food needed.

Meals.—The first meal (breakfast) should be taken before beginning the day's work, and for those having good digestion, most work, mental or physical, can be done on fat food, such as bacon.

Dinner should be taken early in the day, and ought to be the principal meal; the kind of food does not matter much so long as it is well cooked and sufficient in quantity, but those having weak digestions should avoid cheese, pickles, spices, and pastry.

Supper should not be a heavy meal, and should be taken some time before going to bed.

Hard work can be done in perfect health without animal food. Rice, oatmeal, flour and maize, along with milk, are all good and cheap staple foods, and quite sufficient for both health and work; but animal food is more digestible and contains more nourishment in an equal weight.

Potatoes and vegetables are valuable parts of dietary, especially where milk cannot be had.

"Be temperate in all things."

Drink.—A man requires from two to three imperial pints of fluid daily, between his food and drink. Drink should be taken chiefly along with the meals; a moderate amount favours digestion, but a large amount hinders it.

Tea, Coffee, Cocoa.—Tea, coffee, and cocoa in moderation are wholesome and excellent drinks, acting as gentle stimulants and favouring digestion, but if taken too often, too strong, or in immoderate quantity, they are apt to cause indigestion and nervous headache. Coffee and green tea are the most stimulant, sometimes even causing slight symptoms of poisoning. Cocoa is the least stimulant but most nutritious. They all diminish the waste of the body and remove the sense of fatigue.

Milk.—Milk is both food and drink, and may be used with advantage either natural or sweetened and boiled. A considerable amount of the indigestion and decayed teeth of the present day is due to the use of hot sweet drinks, which would be avoided by substituting milk, which is directly nutritious, for tea and coffee, which are merely stimulants. Dr. Ferguson, after careful continuous measurement of factory children between the ages of 13 and 16, came to the conclusion that they grew nearly four times as fast on milk for breakfast and supper as on tea or coffee.

Along with dinner one of the best ways of taking fluid is in the shape of soup, but chief of all drinks is pure water.

Water.—Water should be clear, transparent, and free from suspended particles, and should be entirely without smell; some coloured waters, however, are fairly wholesome when the colouring matter is iron, clay, or peat; while some clear waters are unwholesome from containing organic matter. Water from

deep wells is to be preferred to surface water or water from shallow wells, as it is less liable to be contaminated by soaking of drainage or cesspools.

Test.—To form a proper opinion a chemical and microscopical examination of the water is necessary, but a rough test may be applied as follows: half fill a clean stoppered bottle, replace the stopper and put it to stand in a warm place for five days, when there will be a disagreeable putrid smell if it contains organic matter. If the water is bad either from containing organic matter or from being too hard, all used for drinking, cooking, and washing dishes should first be boiled and then filtered. Boiling throws down most of the salts causing temporary hardness and forming the crust in kettles, leaving the water much softer, and after standing a day, or being poured from vessel to vessel several times to get back the air expelled by boiling, it is also more palatable. Boiling also destroys some of the organic matter, and in most cases renders the remainder innocuous by destroying the disease germs. Filtering removes the grosser impurities, destroys some of the organic matter, and if the material used be spongy iron or vegetable charcoal, it will for a time remove some of the salts in solution. The filtering material should be renewed every three to twelve months according to the quality and quantity of water passed through it, and filters which profess to last for ever or to be self-cleansing should be avoided. Spongy iron filters are the best, but are very expensive, and animal charcoal is very good for a more limited time; after long use the charcoal must be reburnt or fresh charcoal procured. When a filter ceases to do good it begins to do harm.

Compressed charcoal block filters are cheap and good, or one may be made as follows:

Filters.—Get a 12-inch flower-pot; cover the hole with a piece of perforated zinc, and put in some well

washed gravel, with the larger pieces below, to a depth of 3 inches; above the gravel put 3 inches thick of white sand which has been well washed; above the sand place 4 inches thick of animal charcoal (about 2 lbs. weight) which has been washed in a jug by pouring boiling water over it, and when the charcoal has settled, the water poured off and more poured on till it has been washed four times.

When the filter is finished pour the water to be filtered into the flower-pot and let it run through the hole into a glass bottle beneath. When the charcoal gets clogged from continued use, scrape some off the top, boil it two or three times, dry it before the fire, and it is greatly benefited. A pocket filter is often of great service to tourists and travellers, from the only available drinking water being unwholesome. (The Silicated Carbon Filter Company of Battersea, London, make a very good one which weighs only a few ounces, and is cheap enough to be thrown away when its energy is decreased by use.) If drinking water is kept in the house, it should be in glazed earthenware or stone jars with covers, which should occasionally be emptied and wiped with a clean cloth.

Cisterns should be emptied and thoroughly cleaned out from time to time, and should be provided with a cover to exclude dust.

The want of palatable water and of soup at dinner is and has been the cause of the widespread use of beer as a beverage, when otherwise it would be neither desired nor needed.

Various Drinks.—For quenching thirst the various acid drinks, such as raspberry vinegar, are very pleasant, but should not be indulged in by those of rheumatic tendencies. Cold tea is a most refreshing drink, especially in prolonged railway travelling. The best drink for severe physical exertion is oatmeal and water; $\frac{1}{4}$ lb. oatmeal boiled for

some time in three quarts of water and sweetened with $1\frac{1}{2}$ ounces of sugar, drunk hot in winter and cold in summer, is a sustaining and thirst-quenching drink superior to any other. Before drinking shake up the oatmeal through the fluid, and if too thick add more water.

Alcohol.—For the great majority of persons under middle age alcohol in any shape is unnecessary,¹ and beyond a limited amount does harm. All employers of labour on a large scale are now aware that even a small quantity of alcohol lessens the endurance, energy, and cheerfulness of men under hard work. A dose of spirits increases the energy for a very short time and then leaves more depression than before, which a second dose cannot counteract, the best stimulant in these cases being extract of beef. Alcohol greatly lessens the power of resistance to cold and to disease. It is found by the statistics of several insurance companies that total abstainers live considerably longer and are less subject to sickness than other persons who are of sufficiently temperate habits to be accepted as good lives. There are some, however, chiefly those of weak languid circulation, with pale face and cold hands and feet, who require a moderate amount of alcohol, preferably light wines or beer. After middle age a considerable proportion are affected with weak or sluggish digestion, and to them St. Paul's advice to Timothy is applicable: "Use a little wine for thy stomach's sake and thine often infirmities." Individual peculiarities must determine the particular form in which the alcohol is taken, but in all cases (except acute diseases) it must be moderate in amount and taken along with meals or just after. It ceases to do good when it amounts to more than 2 ounces pure alcohol in twenty-four hours (Sir R. Christison, Dr. Parkes).

¹ Romans xiv. 21.

The approximate amount in twenty-four hours beyond which it is not desirable to go when alcohol is required are $1\frac{1}{2}$ pint of common beer or cider, or $2\frac{1}{2}$ pints of table beer, or $\frac{3}{4}$ of a pint of light claret (a little more than a reputed wine pint), or three small glasses of sherry or port wine.

Long-continued use of spirits is almost always injurious, and it is to be preferred only when it is administered in positive disease and under medical direction.

Exercise.—All employed in sedentary occupations should endeavour to have at least one hour a day in the open air either walking, riding, grass cutting with a machine, gardening, or the like, and, if this is impracticable, to use light dumb bells or practise gymnastics. Any action which quickens the breathing and pulse is exercise: the object being to eliminate the waste products from the blood by means of the lungs. Where too much food and too little exercise are taken, part of the carbon which ought to have been burnt off from the lungs as carbonic acid is stored up as fat, and often in the wrong place, as seen in the fatty livers of the Strasbourg geese used to make the famous *pâté de foie gras*. For the weak and those above middle age exercise should be gentle and with rests, and not carried so far as to give a lasting sense of fatigue. After severe and long-continued exertion, the next meal should be light and digestible, and in continuous exertion for many hours light digestible food should be given every two hours to keep a continuous stream of chyle pouring into the blood like the fuel in the furnace of a steam boiler.

In very severe exertion the nervous energy is exhausted so far that there is not enough left for proper digestion; and if food is taken shortly before, the sudden demand for nervous energy stops digestion, or if taken soon after, the want of it prevents

digestion, and the food lies fermenting in the stomach and causes irritation, or it may be vomited.

Bathing.—The body should be washed all over daily and rubbed dry with a towel. With strong people cold water should be used except in winter, when a little warm should be added to take the chill off. Swimming both washes and exercises, and should be encouraged as much as possible. The length of time in the water varies with the person from one minute to an hour. After coming out of the water the body should be quickly and thoroughly rubbed dry, and in the course of a few minutes there should be a warm glow of reaction. If the body remains chilled, pale, blue, or shrunken, the time in the water has been too long, or the person is too delicate for cold bathing. Like all good things, cold bathing has been made to do a good deal of harm. People of delicate health and feeble circulation have been so thoroughly chilled as to give a great shock to the constitution, or even to cause death in some cases. Sea bathing should preferably be in the morning about two hours after breakfast, and some food should be taken after it when the warm glow comes on.

The Turkish bath is extremely cleansing, and is one of the most pleasant ways of getting rid of a cold before it has gone far. It is also very useful in rheumatic affections, provided there is no heart disease, and should end with a cold plunge or douche, to close the pores of the skin and prevent catching cold.

Teeth.—The preservation of the teeth is a very important matter, for if the food is not properly chewed the stomach has more work to do, the juices are lessened, and indigestion is apt to come on. A great cause of the decay of teeth is small pieces of food sticking between them and undergoing fermentation favoured by the heat and moisture of

the mouth; the enamel of the tooth softens and finally decays, forming a cavity (see p. 297). To preserve the teeth they should be brushed twice a day or oftener; if done regularly there is no need for tooth powder, a soft brush and cold water being sufficient. Of tooth powders, prepared chalk, ponderous magnesia, and charcoal deserve the preference, and of liquids camphor water is suitable; the great preservative in all cases being constant cleanliness.

Clothing.—Individual peculiarities must determine the amount to a considerable extent; but better too much than too little. Those having a tendency to rheumatism or bronchitis should always wear flannel or chamois leather next the skin, and all should have warm dry coverings of the feet; damp feet are a fertile source of mischief.

Sleep.—Individual differences in the amount required are very great, varying from five to nine hours in the twenty-four, and averaging about seven.

The last heavy meal should be three hours before going to bed; if digestion is going on, sleep is not refreshing, but a small quantity of food helps to procure sleep by withdrawing blood and nervous power from the brain. If the mind is active and excited as by hard reading, it is useful to turn the thoughts to something else for about half an hour before going to bed. The mattress should preferably be of fine horsehair, and the bed-clothes moderate in amount. The bedroom should be airy and well ventilated, but free from draughts.

Medicines.—Many people are never satisfied without taking drugs for every ailment, real or imaginary, and often cause serious mischief by persistent use of unsuitable remedies. The most frequent cause of uneasy feelings not amounting to positive illness, is constipation. The formation of

a regular habit as to time in the action of the bowels is important; the body mechanically and unconsciously repeats actions which at first proceed from the will. If there is a want of due secretion by the lining membrane of the bowels, a tumbler of cold water in the morning and the use of brown bread usually suffices along with moderate exercise.

Purgatives.—Where more active treatment is required castor oil is the safest and mildest; next to it is the compound rhubarb pill; and stronger still is the colocynth and hyoscyamus pill of the *Pharmacopœia*.

No respectable medical man employs any secret medicine, and any member of a high-class body, like the College of Physicians, who professed to have any secret remedy or method of treatment, would be at once expelled as a disreputable character. It is the duty of every medical man who makes a discovery to publish it at once, so that the sick people all over the world may have the benefit.

The chief basis of the whole race of patent pills and quack purgative medicines is aloes, which is cheap, powerful, and injurious when long continued or in quantity; variously combined with jalap, scammony, colocynth or gamboge, and sometimes a volatile oil, as oil of peppermint, cloves, caraway or aniseed, they are sold under various names, as antibilious pills, vegetable pills, liver pills, wind pills, camomile pills, or by the name of the proprietor, or of some former well-known physician.

The fault of quack medicines is not always that they are directly hurtful—in fact, some of them are tolerably good preparations and closely resemble some of those in the *Pharmacopœia*—but invariably false and lying statements of their effects and uses are given, and they are recommended to be taken in many cases where they are sure to do harm, and in very few indeed do they effect any lasting good, as

they are always recommended to be too long continued even when they are suitable.

The history of a quack remedy formerly of great repute is very instructive, and the moral applies to many of those in the present day whose ingredients are "brought at great expense from the East" (of London?). Before paraffin oil was generally known, a famous quack remedy for rheumatism, and which maintained its reputation for two generations, consisted of water from a spring which contained a slight trace of petroleum just enough to flavour the water. but when paraffin became common it fell into disrepute at once. The moral of which is that many people have no faith in anything which is simple, common, and reasonable, if they know what it is; like Naaman, they wish to be bidden to do some great thing, and as the old cattle stealers' proverb says, they see "large horns on distant oxen." Provided the remedy was harmless, as their faith was generally in inverse ratio to their power of judgment, it often did much good by exciting hope and cheerfulness—the best tonics. Metallic tractors were a once very popular remedy of this kind before electricity was so well understood as it is now, and they had the great advantage of never doing any harm; bits of wood painted to resemble metal and deceive the person operated on were found to have the same effect.

Another class of people who show a wonderful want of "sweet reasonableness" are those who, having tried some medicine, or seen it tried on some of their friends either of their own accord or by a doctor's prescription, straightway recommend it to the next sick person they meet, without any reference to the disease being the same or even at all like it. For example, the author once prescribed medicine to be taken inwardly for a patient suffering from a cough, and on his next visit found that the patient was so pleased with his medicine that he

recommended it to a friend suffering from rheumatism of the knee, over which it was rubbed. A modified fable of Camerarius illustrates this mode of acting. "An ass laden with salt was crossing a river; the water dissolved the salt and lightened his burden: delighted with his discovery, he communicated it to a brother donkey laden with wool. The latter tried the experiment, and found his load doubled."

Soothing Medicines.—Long-continued use of any of the narcotic medicines, *i.e.*, which procure sleep, is to be deprecated. The different preparations of opium disturb digestion and lower the general health, and are apt to cause a craving for their continual use like a drunkard's craving for alcohol. Continued use of chloral, which causes less disturbance than opiates, weakens the heart and may cause death without the dose being increased; a single full dose of a narcotic may cause death in weakly people suffering from bronchitis. The active principle of most of the soothing patent medicines is opium—in small quantity, but enough to be dangerous to infants, for whose use many of them are advertised as soothing syrups, carminatives, etc. Some of these patent medicines are excellent preparations in themselves, but they require to be used with discrimination and not as they are advertised.

Plasters, which are sold as strengthening plasters, porous plasters, poor man's plasters, etc., have very few of the virtues claimed for them, but by keeping the part at rest and warm like a poultice they do a certain amount of good and seldom do any harm.

Dwellings.—The soil should be well drained and a damp course laid in the walls—that is, a layer of asphalt or tiles which prevents the damp from rising. Damp low-lying houses are a common cause of rheumatism and consumption. The windows should all be made to open for ventilation, and if

made of plate glass heat does not pass out so readily. They should extend well up towards the ceiling, and open from above as well as below, in order to give vent to the foul air at the ceiling. For persons with delicate lungs a house is best heated by a stove in the hall, which should have an inner glass door to prevent cold draughts.

Gas stoves, unless provided with a chimney to the open air, are pernicious. Drains should not cross a house and should be made of glazed tiles.

All soil pipes, etc., should be properly trapped and ventilated to prevent the sewer gases rising. To try if it is so, light fires in all the rooms; close the doors and windows and all erevices, and as the fires exhaust the air, if there is leakage of sewer gases the suction of the fires will draw them up, and an offensive smell will be felt. The sewer gases may not be offensive, though quite as dangerous. The easiest way to detect leakage in that case is to soak some cotton waste in paraffin, put it into the end of the soil pipe, and set fire to it, when the smell will be detected if the drains are defective. The points to be attended to are, first, that the house pipes are cut off from the drain or sewer by a disconnecting trap, which usually consists of a siphon bend in the pipe that retains enough liquid to seal the pipe, and of a ventilating opening on the house side of the water seal; second, that waste and soil pipes are tight and do not permit sewer gases to break into the house; and third, that the production of sewage gas be minimised by free ventilation of drains and pipes, laid so as to insure a rapid and complete discharge of sewage ("Sanitary Houses").¹ All schools and large houses should be regularly inspected by a

¹ Those building or altering houses may derive valuable hints on drainage, water supply, ventilation and warming, etc., from "Sanitary Houses" (lectures to builders and plumbers), published by MacLachlan & Stewart, Edinburgh, price 1s. 6d.

sanitary engineer once a year or oftener. In Edinburgh the Sanitary Protection Association by its officers undertakes this duty for a small annual payment. Typhoid fever is said to attack the rich who live in good houses more than the poor: the reason is that the houses of the rich have all got drains and are generally in the higher parts of a town; the sewer gases containing the germs of the fever rise to the highest point and are sucked in by the action of the fires, especially when the hot air of a house begins to cool towards morning, while the houses of the poor, having generally only privies, are not in connection with the sewers, and hence escape the germs.

PART I.

GENERAL DISEASES.

CHAPTER I.

DISEASES CAUSED BY POISONS ENTERING THE BODY FROM WITHOUT.

Nature.—In all infectious diseases the infection is of the nature of a living germ (seed, bud, or egg), which multiplies after its introduction into the body, so that the smallest particle, if it falls in a condition favourable to growth, may give rise to a severe attack.

Origin.—No infectious disease originates of itself any more than wheat grows without being sown; thus all infectious diseases are properly parasitic diseases, the difference being that in diseases usually so classed, the animal or plant causing them is of sensible size, while in fevers it is of extreme minuteness. The analogy between the cause of infectious fevers and seeds, such as wheat and barley, seems very close.

Analogy.—1. Like the various seeds each infectious disease breeds true. Measles produces measles, and small-pox produces small-pox, just as certainly as sowing wheat produces wheat, and not barley.

2. Each has its own well-marked type, some attacking one part of the body more especially, and some another, having a more or less definite period of incubation or hatching, increase, and decline.

3. In the majority of infectious fevers, one attack

usually exhausts the liability of the body to that disease, and when a second attack does occur it is usually much milder, just as a second successive crop of the same kind is less vigorous.

A well-known germ, the yeast plant (*Torula cerevisiæ*), may be taken as an example of one giving rise to the phenomena of a specific fever (*"Fever in a bottle"*). If a little yeast be added to a bottle full of suitable solution such as wort, there is seen: (1) a period of latency; (2) rise of temperature (fever); (3) period of decline of temperature; (4) the infecting material (yeast) is increased; (5) the patient (bottle) is protected against another attack.

Type.—The type of different epidemics of the same disease may be supposed to be analogous to different varieties of seeds: thus one variety of peas grows quicker and heavier than another. So in one epidemic the symptoms are very severe, and a great proportion of those attacked die, while in another the symptoms are mild and deaths very few.

Constitutions.—The different constitutions and conditions, or surroundings, may be supposed analogous to the different soils; one person easily taking infection and suffering severely, while another appears absolutely incapable of taking it. The predisposition to take one disease may be very great, and yet there may be great resistance to all others. People in strong health as a rule offer great resistance to all diseases; possibly the vigorous life throughout the body does not easily allow the growth of germs (strong grain chokes weeds), while weakly people offer less resistance. Infectious diseases often run in cycles; *e.g.*, whooping cough prevailing one year, and scarlet fever the next.

From the foregoing considerations we shall have an intelligent idea of the reason of our treatments, and fresh details will suggest themselves according to circumstances.

Harmless Germs.—Besides the germs which produce infectious diseases, the air is always more or less loaded with comparatively harmless germs which cause the putrefaction of dead matter, and which if they fall upon a wound may (a) manufacture from the secretions a poison which may be taken into the blood and cause a disease called septicaemia; this poison does not multiply within the body, but unless the production in the wound be arrested, enough will be formed to kill the patient. (b) May, without producing any definite poison, give origin to substances which irritate the wound, and so delay or prevent its healing, and cause it to pour out pus or matter. The object of the great improvement introduced by Professor Lister is to prevent the formation of irritating compounds in wounds. Antiseptic surgery accomplishes this, either by denying germs access to the wound, or by killing them by poisoning before they reach it.

Germs cause their evil effects in two ways: 1st, by their growth depriving the cells and tissues of the body of their proper nourishment: 2nd, by forming chemical compounds which act as poisons or irritants. All putrefactive germs do not require the same conditions for growth that large animals do: one at least flourishes in hydrogen and cannot live in oxygen. Germs cannot grow in a single element or in a mixture of several elements which do not chemically combine. All living things, from the hyssop to the cedar, from a mosquito to a whale, and germs also, are really engines, and like steam engines require fuel to do their work, part of which in living things is growth, and if the elements in which they are placed do not combine, germs can no more grow than a railway engine can run with a fuel of bricks (see page 127).

Preventive Treatment.—In preventing the spread of infectious diseases we use exactly the same precautions we should take to destroy the vitality of

seeds, remembering that some are very hard to kill, and if a single one escapes the mischief may begin again; hence we see the importance of thoroughness, though less perfect means are of use, as the undestroyed germs may not fall in a position favourable to growth, and we know that in many cases, as dock-seed, fern-seed, or cod-fish roe, not one seed or egg in a thousand reproduces its kind.

Heat.—To destroy the vitality of seeds we may use:—

1. Kiln-drying, that is baking at a high temperature; exactly the same measure, baking for two hours at 250° F., destroys infection germs. Two hours may seem a long time for germs, but cooks allow a longer time in proportion to the largeness of a joint, not that the meat at the centre requires more roasting, but that the heat is longer in reaching it; and blankets, etc., requiring to be baked, are relatively to the size of the germs very huge joints indeed; moreover, while there is no harm in the germs being overcooked, there is great danger of their being underdone. The vitality of a few seeds and germs resists the temperature of boiling water (212° F.) without being destroyed; *e.g.*, raspberry bushes may be grown from the seeds in raspberry jam, but the vitality of the vast majority of both seeds and germs is destroyed by it.

2. Again, to destroy the vitality of seeds, we may use:—

Disinfectants.—(a) Various chemical poisons, even common salt; but what poisons one kind does not always poison others; or

(b) We may burn them. So to destroy disease germs various disinfectants are used.

(a) *Poisons.*—One class, of which carbolic acid is an example, acts by poisoning the germs.

(b) *Burners.*—Another class, of which permanganate of potash (Condy's Fluid) is an example, acts

by burning them, with the same result as burning in a fire. Prolonged exposure to air has also this effect, especially in strong sunlight, and is the natural disinfectant.

There is a very prevalent error that all deodorants are also disinfectants; but this is by no means the case: thus freshly roasted coffee is a capital deodorant, but is not a disinfectant.

3. Cold arrests the growth of seeds and germs; hence diseases, the germs of which multiply out of the body, such as cholera and yellow fever, are more prevalent in summer and in hot climates than in winter and cold climates.

Vitality.—Seeds when kept dry and not much exposed to the air retain their vitality for centuries; so also disease germs in similar circumstances—*e.g.*, in folded blankets in a chest—have retained their vitality for years. From this we may also understand how a healthy person may convey infection by his clothing and yet never be sick himself.

Contagia.—The contagia or disease germs are usually given off in most abundance by the organs most implicated, and towards the end of the attack; thus from the emanation from the lungs in whooping-cough, from the false membrane in the throat in diphtheria, and from the discharges from the bowels in typhoid fever and cholera.

Some disease germs, whose local action is chiefly on the bowels and stomach, *viz.*, cholera, dysentery, typhoid and yellow fevers, multiply out of the body, or at least remain in vigorous vitality in a suitable soil; hence the importance of having soil pipes properly trapped, cesspools removed, and of cleanliness generally, not only because filth is injurious in itself, but because it furnishes a breeding-place for disease germs.

Infection.—The modes of infection are three in number.

1. Disease germs may be inhaled and enter the blood by the lungs and air passages, as in most of the fevers, *e.g.*, whooping cough and mumps.

2. Disease germs may be swallowed with the food or drink, usually the case in typhoid fever, the germ being contained in drinking water or milk.

3. By direct application to the broken skin or thin mucous membrane, rare in fevers but occasionally seen in erysipelas.

Accordingly to avoid infection—

Precautions.—1. We should not remain long in a sick room without going into the open air. (Dilution with abundance of fresh air destroys the germs.)

2. When in the sick room avoid breathing the patient's breath or standing in the draught from him to the fireplace. (Avoid breathing the germs.)

3. Eat and drink nothing that has not been boiled some time, and have all cups and dishes washed in boiling water or water that has been boiled. (Boiling destroys germs.)

4. Avoid touching the secretions, and use plenty of soap and water or carbolic acid and water. (Wash away and destroy the germs.)

When, unfortunately, we have to do with an infectious disease, the following precautions should be used to prevent its spreading to others before, during, and after the patient's reception:

1. The sick room should be at the top of the house (hot air rises, germs included), and should be well lighted and ventilated. All carpets, curtains, bed-hangings, etc., and all unnecessary furniture, should be removed. The walls should be lime-washed, painted, or varnished if such a room is available. The bedstead should be iron or brass, and the furniture wood or metal. (Avoid giving a lurking place for the germs.)

2. The patient should be isolated, no one of the household but the nurse being allowed in. A sheet should be fixed outside hanging down over the sick room door and moistened from time to time with carbolic acid and water 1 to 40—*i.e.*, two tablespoonsful to an imperial quart of water—or with permanganate of potash (Condy's Fluid) 1 to 50, or solution of chloralum.

The object of the sheet is to destroy any germs which may pass through the door, and as carbolic acid is volatile it is to be preferred; but if the odour is objectionable, chloralum solution or permanganate of potash, though not so effective, is useful and is odourless.

The nurse should wear a linen dress, or, at any rate, not woollen, but some smooth washable material, and should have a wrapper or dressing gown to be worn in the sick room and left in it when she goes out.

Precautions as to the patient, oiling the skin, etc., will also be given under each disease.

In infectious fevers where the outer skin peels off, as scarlet fever, when the skin begins to peel the whole body should be thinly anointed with carbolic oil 1 to 40, which may be washed off and reapplied every day; the object being to clog the scales of skin and prevent them flying about and so becoming a source of infection. When the skin ceases to peel the oil may be finally washed off in a warm bath of carbolic acid and water 1 to 240, or two ounces to three gallons of water. If cold water is used, the carbolic acid must be increased to 1 to 160. Soiled linen should be at once put into carbolic acid and water 1 to 40 till convenient to wash it. In cholera, typhoid fever, and yellow fever all the discharges should be disinfected by putting some carbolic acid into the bed pan before each time of using, and the stools, etc., after being disinfected, buried away from

wells or running water, or mixed with a larger quantity of crude carbolic acid, say three table-spoonsful, before being sent down the water-closet. The patient should spit into a vessel of carbolic acid, and all dishes used by him should be disinfected either by boiling water or carbolic acid.

3. After the disease is over, the sick room and contents must be thoroughly disinfected. All blankets, books, and small articles should be baked two hours at a temperature of 250° F.: this may be done by putting them in a wooden box into an ordinary oven. The patient's linen, after being disinfected, should be scalded or boiled and washed. White woollen articles can be baked for two hours at 250° F. without any change except a slight discoloration like that produced by washing new flannel. The strength of texture and warmth of blankets are not affected. Cotton, silk, linen, and paper are not affected by a considerably longer time. At 300° F. white woollen articles are singed, and coloured wool loses its colour, but its strength is little affected; cotton, silk, linen, and paper are not materially altered in appearance. When hair mattresses are baked they should be allowed to stand for two days before making up again, so that they may recover their natural moisture and not cause dust. The sick room itself must be disinfected, the atmospheric and inaccessible places by disinfectants in the shape of gas, of which sulphurous acid and chlorine are the most common, cheapest, and best. The furniture and accessible parts of the room are more thoroughly disinfected by disinfectants in the shape of fluids, of which carbolic acid, permanganate of potash, chloride of zinc, chloralum, and boiling water are the most common; carbolic acid is neutralised by most of the fluid disinfectants, and should always be used by itself.

Remove all bright steel or metal articles from the

room. Paste up all chinks of windows, fireplaces, etc., with paper. Put a bucket of water in the middle of the room and lay the tongs across it, and on the tongs an iron lid or dish with, say, two pounds of sulphur in it; set fire to the sulphur and shut the door for a night. Any disinfectant vapour so weak that it can be breathed even for a single instant is of no use; hence it is useless to expose saucers of carbolic acid or bleaching powder (chloride of lime) in the sick room: the vapours merely annoy the patient and do no good.

Next day the floors should be washed and scoured or scalded if practicable; the walls lime-washed, or, if varnished, washed with soap and water. The bedstead and furniture should be scalded or washed with carbolic acid, soap and water. Finally the door and windows should be left open for a couple of days (see p. 422). When these precautions are thoroughly carried out there is no danger of infection.

Curative Treatment.—The cells which form the tissues of the body have a separate local life of their own, and when removed under the microscope live for hours if kept at a proper temperature.

Death of the cells singly is seen in an ulcer; death of a mass of cells is mortification. Our object then is to poison the germs without also destroying the tissue cells. Unfortunately in all the infectious diseases we are as yet unable to do this: we can merely prevent complications, and mitigate the severity of the disease; in short, we can guide, but not stop the disease.

In malarious diseases, on the other hand, we have such a poison in quinine, and are usually able to stop the disease, quinine being a poison to those low organisms and a tonic to the tissues, as quassia kills flies and yet is a tonic (improves the general health) to human beings. Though quinine kills the germs

and stops the disease, it does not undo the mischief which has already been done, such as enlarged liver, spleen, etc.

SIGNS IN DISEASE.

Pulse.—The pulse is the stroke or beat of an artery, caused by the wave of blood forced onwards from each beat of the heart. It is usually felt in the radial artery at the wrist by slightly pressing the first two fingers on the front of the wrist about an inch above the upper joint of the thumb and just inside the first tendon of the forearm. The natural pulse in the adult male varies between 60 and 70 beats per minute, and in the female is about 10 beats more. It is quicker in the morning than at night, reaching its maximum about noon and its minimum about midnight. The pulse is about 10 beats per minute quicker when standing than when sitting, about 5 beats quicker when sitting than when lying, and about 15 beats quicker when standing than when lying. In a newly born infant it is from 130 to 140 beats in a minute, at three years old 90 to 95 or 100, at five years old about 88, at ten to fifteen years old about 78, and above fifteen 65 to 75. Warmth and heat, rapid breathing, exertion, strong mental emotions, stimulants, and active digestion increase the frequency of the pulse, while sleep and the recumbent posture diminish it. Besides the frequency of the pulse, its character should be noted; the points to be noticed are :—

1. Frequency or number of beats per minute.
2. Fulness or volume.
3. Strength of pulsation.
4. Regularity or rhythm.
5. Resistance to pressure, or compressibility.

A quick and strong pulse is suggestive of inflammation.

A quick and weak pulse is suggestive of fever or weakness.

Slow and strong pulse is suggestive of pressure on the brain.

Slow and weak is suggestive of shock, depression, jaundice.

The following varieties of pulse are recognised by the educated touch.		Seen in
2.	{ Large or full Small	
3.	{ Hard Soft: usually full and weak Unequal: some beats strong, some weak	
4.	{ Irregular: some beats quick and some slow Intermitting: some beats omitted Fluttering Tumultuous	Indigestion " " Hypertrophy of heart
5.	{ Compressible Wiry: hard, small, and strong Laboured: passes slowly under the finger Thrilling Leaping, bounding, locomotive, jerking: pulse of unfilled arteries, blood shot along in balls	Pressure on the brain Some fevers, before bleeding Valvular disease of the heart

Temperature.—The temperature is ascertained by a clinical thermometer, which is usually placed in the armpit, sometimes beneath the tongue, which is $\frac{1}{2}$ of a degree warmer than in the armpit, or in the bowel, which is $1\frac{1}{2}^{\circ}$ more than the armpit. The index, or small detached piece of mercury in the

tube, should be kept up, and, just before using, should be shaken or jerked down by a single rapid swing of the arm, till its upper edge is below 95° F.; the bulb of the thermometer is then to be placed next the bare skin in the armpit and the arm closed upon it, where it should be left for five minutes or more, and, on removing it, the figure opposite the upper edge of the index shows the temperature. The most suitable time for taking the temperature is from seven to nine o'clock in the morning, and from five to seven in the evening. The usual temperature in the armpit is 98.6° F., and any considerable deviation from this (above 99.5° or below 97°), if it continues, shows disease of some kind.

Indications from Temperature.—1. A very high or very low temperature generally indicates danger; if exceedingly high or low, it usually marks fatal termination. 2. A fresh rise of temperature after it has begun to fall or has been stationary for some time usually marks the approach of some new disease, or a complication of the existing disease, or relapse. 3. Very sudden changes of temperature often indicate danger; a sudden fall usually accompanies perforation of the bowels, as in typhoid fever, or the lining membrane of the lungs, bleeding, or severe diarrhoea, or cholera. 4. A considerable rise in a disease not usually accompanied by high temperature, such as epilepsy, tetanus, cancer, etc., often precedes death. If the temperature falls from the evening to morning, it is a favourable sign; if it rises from the evening to the morning, it is unfavourable. The pulse is usually increased by about eight beats per minute for every degree of temperature over the normal 98.6° F.: thus if the pulse is 72 with the temperature at 98.6° , it will be 80 when the temperature is 99.6° , and 88 when the temperature is 100.6° .

A clinical thermometer (four inches long, which

is a convenient size) with contracted stem to prevent the index falling into the bulb, and its case, can be had for 6s., and with a Kew certificate of verification, for 7s. 6d.

Respiration.—The respirations in health are 15 to 20 in a minute, averaging 18, or about one to every four beats of the pulse. The points to be noticed are the frequency per minute, whether respiration is performed chiefly by the ribs (thoracic) or by the muscles of the belly (abdominal); if the breathing is calm, easy, and fully drawn, or if it is short, hurried, forced, or incompleted; if it causes pain or is checked by cough. See also page 252.

Fever.—Fever is a complex condition, in which the temperature of the blood rises above the usual standard; when the temperature exceeds 107° F. the fever is so excessive that there is great danger of death. Fever may be produced by many different causes, *e.g.*, inflammation, gout, ague, rheumatic fever, scarlet fever, etc., and generally begins with a fit of shivering, which may be so slight as to be unnoticed, or so severe as to shake the patient's bed under him; along with the shivering are hot and cold flushes, sometimes as if cold water were running down the spine.

When the fever is the result of some local disease or injury, it is called secondary or *symptomatic*; when fever occurs before any local effect, it is called *specific*.

When a fever is not severe, prolonged, or combined with any local effect, it is *simple* fever.

When the temperature rises steadily daily up to the maximum without any decided fall, it is a *continued* fever, *e.g.*, typhus, measles.

When a marked remission or lull in the symptoms occurs, it is *remittent*, *e.g.*, typhoid fever, tropical fever, hectic fever.

When periodic fits of fever occur, beginning with

a cold stage or chill, followed by a hot and a sweating stage, then a period of freedom followed by a return of the sequenee, it is called *intermittent*, *e.g.*, ague. When there is a severe continuous drain on the system, as by prolonged suppuration, a fever is set up which begins and creeps on very gradually, with weak, easily excited pulse, heat in the palms and soles, fever increasing towards evening, at its height at midnight, and terminated by profuse perspiration towards morning, termed *colliquative*, because it seems to melt the patient down, and may be accompanied or replaced by diarrhœa; sometimes there is a second paroxysm in the morning. Such a fever is called *hectic*.

A specific fever has a period of incubation or latency, more or less definite for each fever.

1. Premonitory symptoms are chilliness or shivering, hot and cold flushes, sickness, vomiting, headache, weariness, pains in the limbs or back, restlessness, sleeplessness, delirium.

2. Increase of temperature, pulse, and respirations, great thirst, scanty urine, which is thick, red, acid, and of strong odour. The functions of the stomach and bowels are deranged, dry or clammy mouth and tongue, loss of appetite, thirst, constipation.

The temperature may fall suddenly (crisis), all the excretions (perspiration, urine, etc.) being suddenly increased, and bleeding being apt to occur (critical discharge); or it may fall gradually (lysis), or both may be combined, first a rapid fall and then slow.

GENERAL TREATMENT OF FEVERS.

Sick Room.—The sick room should be at the top of the house (hot air rises, germs included). It should be tolerably large with a southern exposure,

neither apt to be unduly heated by the rays of the sun nor rendered dull from its absence. The room should be prepared as recommended at p. 20. The ventilation must be thorough, but no draughts. The room should have a fireplace with a good fire in cold weather, and open in warm weather to assist ventilation. It is desirable to have a small room in immediate connection with the sick room, for the nurse to sleep in, and carry on the various little operations in preparing food and medicine without risk of annoying the patient. The temperature of the sick room should be kept between 60° F. and 65° F. except in diseases of the lungs, when it should be 65° to 70° F. night and day, and a thermometer hung up out of draughts or the direct reach of the fire to indicate the temperature.

Bed.—Should not be in a draught, as between the door or window and fireplace. The patient should lie with his back to the window. A hair mattress is the most suitable, and the amount of bed clothing regulated by the feelings of the patient; but little or much, it must be even, and no part of the body except the head left uncovered.

Nursing.—Faithful nursing is of the utmost importance, in severe fevers making the difference between life and death. To be a thorough nurse requires both natural tact and training, or experience. For slighter cases tact and sympathy are more important; for severer cases training; for both, constant attention both day and night.

The nurse should dress in quiet neutral colours; bright colours are distressing to the eye, while black is depressing and may be the traditional last straw.

Everything must be done for the patient without being asked, to avoid worrying him with questions and forcing him to make up his mind.

Light.—1. The light should be subdued by window-blinds, but not by closing the shutters.

Quiet.—2. The sick room should be quiet; no rustling dresses, creaking boots, or crackling newspapers should be allowed. All speaking must be gentle but distinct, and no whispering allowed.

Rest.—The patient should be disturbed as little as possible.

Cleanliness.—The personal and bed linen should be frequently changed. The mouth should be often wiped with a soft wet towel when there is a crust on the teeth and lips. The body should be sponged over at intervals with tepid or cold water, whichever is preferred by the patient, and quickly dried with a soft towel. When there is delirium or apathy, the bladder must be emptied *at least* twice in twenty-four hours, and the nurse must see that it is so, as mischief may be done by the retained urine. The discharges must be washed off and bed-sores looked for.

Bed-sores.—In severe or long-continued illness, the parts where the chief pressure is begin to lose their vitality; there is a slight reddening of the skin, which begins to look glazed like parchment, and if not arrested the part dies, and is thrown off, leaving a bed-sore, which is very troublesome and even dangerous, by reducing the patient's strength. When the skin looks threatening it should be kept dry, and painted over twice a day with flexible collodion (see MATERIA MEDICA, p. 437) or white of egg beaten up with spirits of wine, and the pressure relieved by a circular air pillow or a nest of cotton wool the shape of a sausage, with its two ends tied together to form a circle.

Blisters are dangerous because they are apt to leave sores.

I. Reduce the excessive heat, by sponging the body with cold or tepid water and quickly drying with a soft towel.

In some cases the cold bath may be required, and,

to be of use, must be employed when the temperature rises to 103° F. or more before the third or fourth day of the fever. The water should be at 95° F., and gradually cooled down to 60° F. by addition of cold water. The time is regulated by the result, but rarely more than twenty minutes. The patient is then dried and put to bed with a hot brick at the feet. The cold bath is a very dangerous remedy and requires great caution, as the temperature goes on decreasing after the bath; like all good things it has been much abused, and caused many deaths by weakening the patient too much to recover; so much so, that one of the first physicians who introduced it, was afraid that in removing one danger he had introduced another.

When the head symptoms are severe, a bucket of cold water poured from a height of about two feet often gives great relief, but is dangerous, and must be cautiously used.

The good effects of cold are seen in slower pulse and breathing, reduced body heat, soft moist tongue, diminished stupor, refreshing sleep or perspiration, which may bring relief.

II. Secure sufficient action of the kidneys, skin, and bowels, but diarrhoea or sweating requires to be checked.

III. Sustain and stimulate the exhausted semi-paralysed nervous system by food and stimulants.

Food.—Must be nutritious and easily digested (see INDIGESTION, page 289), and be given in small quantity at frequent, regular intervals. The smaller the quantity the more frequently it must be given, even if it is necessary to wake the patient.

The intervals may vary from four hours to an hour, more frequently the severer the disease. The food, drink, and delicacies of the patient must not be kept in the sick room nor within sight. The continuous sight or smell of food is apt to produce

disgust for it. The quantity to be taken at one time should be brought to him unexpectedly.

Chief of all foods is milk, natural or boiled; when it feels heavy, soda water or lime water must be added. Beef-tea, not the extraet, eggs, soups, broths, rice, corn-flour, isinglass and milk flavoured and sweetened with essences, spiees or jellies, are all appropriate and valuable articles of food. The following reeipes for restorative beef-tea will be found of use :—

1. Lean meat is finely mineed, mixed with an equal weight of eold soft water, and slowly heated to boiling; boil for one minute, then strain it through a eloth, flavour it to taste. It forms a eolourless and pleasant beef-tea.

2. Take $\frac{1}{3}$ of a lb. of raw beef or chicken, mince it finely, and mix it with fourteen ouncees (a reputed wine pint) of eold distilled water, or rain water, add four drops of hydrochlorie acid, and let it stand for an hour at blood heat or not above 116° F. Strain it through a hair sieve, and wash the residue on the sieve, with five ouncees more of distilled water, which gives nearly a pint of very nourishing beef-tea.

3. Soak 1 lb. of finely mineed beef for an hour in one pint of cold water, heat it slowly, and boil for a quarter of an hour; strain off the liquor, which is an exeellent soup.

Drink.—Best of all is pure eold water. Barley-water, lemonade, raspberry vinegar, toast water, gruel, tamarind water, cold tea without milk or sugar, eream of tartar, a teaspoonful to a pint of boiling water with lemon and sugar—all may be tried by turns, drinking small quantities and often.

All drinks may be taken iced if desired by the patient.

Alcohol.—Aleohol must be used with eaution, and may easily be overdone. The object is to keep

the patient alive from hour to hour till the disease has time to run its course.

Indications for the use of alcohol.—A very slow pulse; soft, irregular, or intermitting pulse; burning dry skin; profuse perspiration and no improvement of the symptoms; dry brown tongue; coldness of the limbs; low muttering delirium.

Indications against the use of alcohol.—Acute noisy delirium; severe darting headache along with a hot, dry skin; flushed face; suffused eyes; strong pulse; suppression of urine; delirium increased by its use.

Good Effects.—Good effects are shown by the quick pulse becoming slower; the tongue clean and moist at the edges; restlessness and delirium replaced by rest and tranquillity or sleep.

Whisky or brandy, with an equal quantity of hot milk or water, are to be preferred during the fever; two teaspoonsful of the mixed fluid every hour, up to a tablespoonful, which is a full dose. If alcohol is required during convalescence, beer or light wines are to be preferred. The dose should be reduced as soon as the symptoms yield.

Medicines.—Stimulants of camphor-water are useful in low forms of fever, but large doses of carbonate of ammonia are hurtful. Except quinine, in ague there is no directly curative medicine, and unnecessary drugging is to be avoided.

To relieve distressing symptoms.

Headache.—Headache at the beginning of a fever may be relieved by an emetic, such as ipecacuanha wine, or by action of the bowels, afterwards by evaporating lotions, such as vinegar and water, or by ice to the shaven head; a single dose of quinine is sometimes effectual. In old people warm fomentation to the head may be better than cold.

Sleeplessness. Sponging the face and hands

with tepid water, or if necessary, opiates, 2 grains of opium (not in children), repeated in four hours if necessary, or chloral hydrate, 20 grains (not with heart disease), may be used.

Swollen Belly (Tympanites).—A turpentine cloth over the belly, and a turpentine globule swallowed.

Hiccough.—Hiccough may be relieved by sucking ice, which can be noiselessly broken by the point of a strong needle.

Vomiting.—Vomiting may be relieved by sucking ice, or by a creasote globule.

Convalescence.—The diet must be carefully regulated; the patient often feels ravenous, and is inclined to over-eat himself. The food should be easily digestible and nourishing.

GROUP I.

INFECTIOUS FEVERS.

The poison is reproduced and multiplied in the body.

SMALL-POX.

(*Variola.*)

1st Stage.—About twelve days after exposure to infection the fever begins with chills, shiverings, flushes of heat, weariness, sickness, headache, *pain in the back*, which is severe and like that of a sprain, and is characteristic of small-pox. There is great thirst, with white tongue, a slimy taste in the mouth, and vomiting, the persistence of which indicates a severe attack. The face is suffused with red, and the great arteries of the neck throb. The eruption can be felt beginning under the skin like grains of small shot. The temperature is very high (104° to 106° F.); each morning there is a

slight remission, *i.e.*, the fever is a little less, but the evening fever goes on increasing till the evening of the third day, when it suddenly falls from 106° to 100° F., when the eruption comes out.

2nd Stage.—As the eruption appears the headache, sickness, and pain in the back decline; it appears first and most abundantly on the face, and often on the wrists, the next day on the neck and trunk, and the following day on the lower limbs. It consists of small red pimples numbering from tens to thousands, which gradually enlarge and ripen into vesicles or little blebs filled with a clear fluid. Each vesicle is composed of several compartments like the spaces between the spokes of a wheel, and is depressed in the centre. The eruption is thickest on the exposed parts of the face and hands.

3rd Stage.—About the fifth or sixth day of the eruption the vesicle enlarges, the contents become cloudy, or like whey, the centre becomes prominent and the divisions are lost, so that if punctured all the contents escape, and are now a thick pus, whence it is called a pustule. The skin around each forms a dark-red inflamed ring, and is much swollen, giving severe tense throbbing pain. Along with the formation of pustules there is the peculiar small-pox odour, and the secondary fever begins, which reaches its height in about three days as the pustules become ripe.

4th Stage.—About the eighth or ninth day of the eruption the pustules begin to ripen and burst; the contents forming soft yellowish crusts, and along with walls harden into brown scabs, which begin to fall off in three or four days, leaving purplish red spots which are a little elevated, while the skin remains swollen, but finally disappears leaving no mark. Where there has been ulceration of the skin, the crusts remain long adherent, and when they separate

leave round deep pits, at first red, but becoming white, and which last during life; even in severe cases many scabs leave no permanent pit, and in the mildest cases a few are apt to leave deep pits. Picking off the scab increases the inflammation, and leaves permanent marks, where, if left alone, there would be none.

The eruption is always closest on the face, and in advance of the rest in its progress, the change to vesicles often beginning at the same time that the eruption begins to come out on the lower limbs.

The severity of the disease is in direct relation to the quantity of the eruption; in very mild cases there being only a few separate spots with sound skin between, while in severe cases they run together (confluent), so that the face seems one huge blister; in these cases the skin is usually destroyed to some depth, and leaves scars like a burning (cicatrices). In fatal cases death generally occurs at the height of the secondary fever as the pustules begin to break.

The eruption on the mucous membranes causes many distressing symptoms from the time of becoming vesicles till the pustules begin to break.

Those in the mouth cause increased flow of saliva, which constantly trickles down. Those in the throat (pharynx) cause difficulty, almost impossibility, of swallowing; those in the air passages cause hoarseness, cough, and sometimes spitting of blood; those in the eyelids and eyes (conjunctivæ) cause burning, watering, and sensitiveness to light. There may be also pain and difficulty in making water, etc.

Among the evil after-effects are ulceration of the eye from continual pressure, which may lead to total blindness; suppuration of the inner ear, which may cause death of a portion of bone (necrosis) and bring on inflammation of the brain.

In very mild and very severe cases of small-pox

the eruption runs through its different stages much quicker than usual.

Small-pox is divided into many varieties.

A. Unmodified or natural small-pox.

B. Modified by vaccination or a previous attack.

The eruption may be :—

1. Confluent. The pustules run together.

2. Distinet. Pustules are separate.

3. Abortive. Only vesicles : few pustules.

	Begin to form	Day of Fever	Day of Eruption
Primary Fever } remits 106° F. to 104° F. . }	Pimples.	3rd.	
	Vesicles.	5th or 6th.	2nd or 3rd.
Secondary Fever } begins from 104° F. to 106° F. . }	Pustules.	8th or 9th.	5th or 6th.
	Scabs } form. }	11th or 12th.	8th or 9th.
Fever gone . {	Scabs } fall. }	14th or 15th.	11th or 12th.

The contagion of small-pox is the most powerful and certain of all fevers. The period of infection begins with the eruption, and continues after the last scab falls off.

The same precautions are to be used in the sick room during the disease, and disinfection of the room and contents afterwards, as in scarlet fever.

Curative Treatment.—Rest in bed in a room kept about 60° F., slightly darkened, in mild cases cooling drinks and mild nourishing food, are all that is required. In severe cases apply cooling lotions to the

head, such as vinegar and water or ice. In all, the hair should be cut short to prevent matting. If there are delirium and restlessness, opiates, provided there is no spitting of mucus; when there is mucus a strong opiate might cause suffocation, by allowing the mucus to accumulate and choke up the air passages. Bed-sores must be looked for frequently, and threatening places painted over with white of egg and brandy or whisky.

If the secondary fever is very high, large doses of quinine, 6 grains every four hours till the fever yields, or till four doses are given, and mild laxatives if there is not free use of the bowels.

Local Treatment.—Paint over the surface with carbolic oil, 1 to 100, and if the pustules are many apply cold-water cloths over them, to restrain the inflammation. If there is much sore throat, a gargle of vinegar 2 table-spoonsful, honey 1 table-spoonful, and water $\frac{1}{2}$ a pint, may be used frequently, say every 2 hours.

Preventive Treatment.—Vaccination or a previous attack of small-pox or cow-pox gives almost complete protection; when there is a second attack, it is usually very mild.

Vaccination.—Is merely a variety of small-pox modified by being passed through one of the cow tribe, and gives more complete protection than even an attack of unmodified small-pox.

Previous to the discovery of vaccination, inoculation with small-pox matter was practised, which usually, but not always, gave rise to a mild attack. In many instances it produced a severe attack, and caused the death of the patient or led to a severe and fatal epidemic, the small-pox produced by inoculation being quite as infectious as that caught by infection.

It is now illegal to practise inoculation. In a small-pox hospital it was found that one in three of

the unvaccinated died, while of the comparatively few who were vaccinated, and yet took small-pox, only one in fifteen died.

If a calf is inoculated with small-pox matter from a human being, it suffers from an attack of cow-pox, and if in turn a human being is inoculated from it as in ordinary vaccination, we have many of the characteristic marks of ordinary mild small-pox: the inoculated point going through the changes of pimple, vesicle, pustule, and scab, along with a certain amount of fever, and giving protection from a subsequent attack of small-pox, but with two most important points of difference: 1. The fever is always comparatively slight, as we should expect in small-pox where there was only one to four spots of eruption. 2. It is not infectious, requiring to be applied to the broken skin in order to cause an attack.

The vaccine matter having once been modified in passing through the cow, remains so in passing through an indefinite number of human beings.

In like manner we see different varieties of vegetables, often very unlike the original plant, as cabbage and turnip; when once produced, they continue to breed true under the same conditions, *i.e.*, cultivation.

The protective power of vaccination seems to some extent to depend on the severity of the attack; hence, as the eruption is only at the inoculated points, it is usual to vaccinate in three or four places. I have often in my practice had mothers complain to me that their children had been vaccinated in more than two places, and have even had them insist on my doing them in only two. Now this is a great mistake, and all mothers should bear it in mind. The statistics of the small-pox hospitals prove beyond contradiction that the disease is in almost every case more severe, the less the number

of marks on the arm, *i.e.*, four places give more protection than three, and so on. I think the regulation of the Local Government Board that Public Vaccinators shall make four good vesicles perfectly right. Vaccination might just as well not be done at all as in one place.

Vaccination does not cure small-pox, but merely exhausts the predisposition to take infection; in some instances both have run their course together. In course of time the protective influence seems to wear out; hence children who have been vaccinated should be revaccinated when grown up.

All children are required by law to be vaccinated within three months of birth unless the child is not in a fit state of health for the operation.

The middle of the upper arm is the place usually selected. The skin is cut to a slight extent, barely sufficient to draw blood, in three or four places, and the vaccine virus rubbed on; on the third day after the operation pimples rise on the inoculated spot, and about the sixth day change into vesicles. On the eighth day the vesicles are at maturity, having several compartments and a central depression. The vaccine lymph may be taken off by cutting the top of the vesicle in several places with a lancet or piercing it with a needle, being careful to avoid touching the inflamed base or drawing blood. The lymph should be clear like water; if cloudy or mixed with blood, it should be rejected; and may be preserved by sealing in small glass tubes, or dried upon ivory points, or simply preserved between two slips of glass; one is laid over the vesicle till the lymph touches it, and it is then covered with another. When about to be used the glasses are separated and one breathed on; the resulting moisture is scraped off with a lancet and laid on the broken skin.

The lymph should be taken on the seventh or

eighth day, from a healthy child who has not previously been vaccinated, and is best used at once, arm to arm.

Any rubbing or bruising of the base of the vesicle causes it to inflame, leaving a painful swollen arm; to avoid rubbing the sleeve should be looped up.

On the ninth day the contents of the vesicle become cloudy, and by the tenth consist of pus which bursts the pock and oozes out, forming a scab that falls off in the course of the third week, leaving a scar marked by a number of distinct pits—evidence of successful vaccination.

In a second vaccination, as in mild small-pox, the changes are much quicker. During the course of vaccination the nearest glands swell, and there is fever which may have a temperature of 101° F. It is sometimes followed by some affection of the skin, but which does not last very long.

As in all fevers, though to a much less degree, there is a shock to the constitution. In very delicate children there may be skin diseases lasting for months, but which may also be brought on by other causes, as teething, weaning, after a blister, or having the ears pierced.

CHICKEN-POX.

(Varicella ; Water-Pox.)

Its chief importance is from its resemblance to mild cases of small-pox.

About four days after exposure to infection, discomfort, loss of appetite, headache, and sometimes chilliness and pains in the limbs, precede the slight fever, with a pulse of 90° to 100° usually. When the fever has lasted from twelve to twenty-four hours the eruption comes out as little pimples, which in a few hours change to limpid vesicles

the size of a pea, looking as if the skin had been sprinkled with boiling water, causing small blisters. *The vesicles have no central depression, and are not divided into compartments.* The contents soon become cloudy like whey, but do not go on to form pus; on the third day the vesicles burst and dry up, and in four or five days the crust falls off, leaving a red spot, but no pit unless it has been irritated or inflamed. Successive crops of vesicles come out every twenty-four hours, and may go on forming for ten or fourteen days, so that pimples, vesicles, and scabs may be found all together.

Differences between Chicken-Pox and Small-Pox.

	Chicken-Pox.	Small-Pox.
Fever . . .	Very slight.	Severe.
Pulse may be	90° to 100°.	120° to 140°.
Eruption thickest .	Breast and Back.	Face (exposed parts).
Vesicle . . .	Forms in 6 to 12 hours.	2nd or 3rd day.
„ . . .	Is one compartment, and is not depressed in the centre.	Several compartments and depressed centre.
Odour . . .	No peculiar odour.	Peculiar small-pox odour.
Vesicles . . .	Contents do not go on to pus.	Go on to pus.
„ . . .	Burst 3rd or 4th day.	Burst 8th or 9th day.
„ . . .	Leave no scars.	Leave scars.

An attack of chicken-pox occurs as a rule only once, usually in young children. It does not protect from small-pox.

Treatment.—Milk diet and stewed fruit, but no animal food; if there is much fever, cooling drinks.

The child should be prevented from picking off the scabs, lest there should be marks left by the inflammation caused thereby.

Convalescence.—In weakly children iron tonics and cod-liver oil should be given for a fortnight; two grains of reduced iron, and a teaspoonful of cod-liver oil twice a day, after breakfast and dinner.

MEASLES.

Ten to fourteen days after exposure to infection the fever begins suddenly, like a severe cold in the head, with chills, shivering, and flushes of heat, sneezing, watering eyes and running nose, and a short hoarse cough. The skin feels hot, and the temperature is high (101° to 103°), the face swells, and some sore throat or diarrhoea may be present.

Eruption.—On the fourth day of the fever the characteristic eruption comes out, first on the chin and face, and extending to the trunk and limbs. It consists of little spots of a raspberry colour, of the size of millet seeds or flea-bites, and forms irregular crescent-shaped patches which disappear on pressure but soon return. It lasts out four or five days, and is succeeded by the scarf skin coming off in branny scales (desquamation). The fever goes on increasing till the eruption is fully out, when in favourable cases it begins to decline. The perspiration after the eruption appears has a peculiar odour, likened to a pickled goose (Niemeyer). The whole duration of the fever is generally nine to eleven days. In

some cases, as in scarlet and typhoid fevers, there is no eruption. In others there is no cold in the head.

The chief danger is from cold, causing bronchitis or inflammation of the lungs (pneumonia), and it is apt to be followed by destructive disease of the lungs (consumption), or by inflammation and running from the ear, eye or nose, by enlargement and inflammation of the glands of the neck, by inflammation of the bowels, or by acute disease of the kidneys (Bright's Disease).

Treatment.—An even temperature of 60° F. to 65° F. day and night. Ventilate the room twice a day, laying a thin cloth over the head and face of the patient. Watch constantly lest the clothes be thrown off, or the neck and arms left uncovered. The whole body must be covered even if only with a single sheet.

Diet.—Should be milk and stewed fruit, no animal food.

Pure cold water. Acid drinks slightly sweetened, oranges, and lemon juice are eagerly taken.

If the cough is severe, small doses of ammoniated tincture of opium and ipecacuanha (see pp. 453 and 448) should be given, but in mild cases drugs are superfluous.

Convalescence.—The patient should remain in bed, or at any rate be confined to the room, till the cough ceases and the skin has ceased to come off in scales. Quinine and iron with nourishing food, and in delicate children cod-liver oil, should be given for some time after the fever is over, averaging about three weeks. Two teaspoonsful of oil and two grains of citrate of quinine and iron, to be taken twice daily, after breakfast and dinner.

Different epidemics vary very much; in some the attack is very severe, and many deaths occur, but generally the attack is slight and deaths few.

Table of Differences between Measles and Scarlet Fever.

	Measles.	Scarlet Fever.
Symptoms .	Watery eyes, sneezing, cough, swelled face.	Hot skin, strawberry tongue, and sore throat.
Pulse may be	100° to 120°.	120° to 130°.
Eruption .	(4th day of fever) Raspberry-coloured spots in crescent-shaped patches, rough to the finger.	(2nd day of fever) Uniform light scarlet, smooth to the finger.
Temperature	(5th day) 101° to 103°.	(2nd day) 104° to 105°.
Skin comes off	In fine scales.	In large flakes.
After-effects in	Lungs.	Throat and kidneys.

SCARLET FEVER.

(*Scarlatina.*)

Symptoms.—Four to nine days after exposure to infection the disease begins with weariness, sickness, pain in the back and loins, chills, shiverings, headache, loss of appetite, often vomiting. The tongue is coated with a creamy white fur and has a vivid red tip; projecting through the white fur are numerous bright red spots (papillæ) like the seeds of a strawberry, hence called the strawberry tongue, which is characteristic of scarlet fever though seen in other diseases.

The throat feels sore and is bright red inside at the back.

Eruption.—On the second day of the fever the eruption comes out, consisting of minute red spots, which increase in number till the skin is of the colour of a boiled lobster. The colour is brightest at the joints and disappears on pressure, but soon returns. The skin feels hot and burning to the hand, the temperature being 104° F. to 105° F. or more, and the higher it is the more serious is the case. The pulse is 120 to 130 beats per minute.

From the fifth to the seventh day of the fever the eruption begins to fade, and is succeeded by the skin peeling off in small branny scales over the body, but in flakes on the hands and feet (desquamation), and may last for several weeks.

Scarlet fever is usually divided into three varieties.

Varieties.—1. Simple (*a*) where there is no rash nor sore throat, and often only recognised by its after-effects.

(*b*) (most common) Scarlet rash and sore throat, but no ulceration (Scarlatina).

2. Anginose. Sore throat ulcerated and tendency to form abscesses in the neck.

3. Malignant. The throat tends to slough, *i.e.*, portions of tissue die bodily, scarlet rash scarcely visible and dusky coloured, or there is none; black patches of blood under the skin, and the delirium of the fever is of the low muttering exhausted kind.

The chief dangers are from causing kidney disease and dropsy, or rheumatism. Scarlet fever is very treacherous; even after the mildest cases, and the lapse of some weeks, there may be affection of the kidneys.

Diagnosis.—The most likely diseases to be confounded with it are measles, diphtheria, and typhoid fever.

Treatment.—In the very mildest form the patient

should remain in the house, and, when the symptoms are only moderate, should keep in bed till some time after the eruption has disappeared. It is particularly necessary to avoid exposure to cold. The sick room should be kept at a uniform temperature of 50° F. to 65° F. night and day, and ventilated once or twice a day, while a thin cloth is thrown over the head and face of the patient in bed, and screens round it. The sick room should have bare floors, no carpets, hangings, or curtains; wooden furniture, and, if such a room is available, one with white-washed, varnished, or painted walls.

Diet.—Pure cold water is the best drink; the juice of oranges, lemons, and acid drinks are often grateful.

The stomach is inflamed as well as the skin; hence there is deficient secretion of gastric juice (see **INDIGESTION**), and the food should be given in small quantities and often, along with pepsin, three or five globules, with $\frac{1}{16}$ th grain of morphia if necessary to prevent purging.

Soups, stewed fruit, and milk and beef-tea are the best food, avoiding much seasoning.

If there be vomiting, sodawater or limewater with the milk must be given in small quantities at a time.

Convalescence.—Iron tonics should be given for some time, either as tincture of the perchloride of iron (steel drops), ten drops twice a day in water; or citrate of iron and quinine, two grains twice a day. In those of delicate digestion, lactate of iron or the saccharine carbonate can be given; the three last are best given in globules, one twice a day. In all the preparations, the dose to be taken after breakfast and dinner, and continued for some time, average three weeks.

Preventive.—When the skin begins to peel it should be rubbed all over with carbolic oil, 1 part

carbolic acid to 40 parts of olive oil, and when the peeling has ceased the oil should be washed off in a warm bath, with a tablespoonful of carbolic acid to every gallon and a half of water.

The reason for this is that the small scales of skin carry infection, and flying about in the air they are inhaled or get caught in the dress, where they may be carried to a distance, and getting loose be inhaled there, causing a fresh attack of fever. The oil clogs the scales and prevents them flying, while the carbolic acid destroys their infecting power. The oil may be washed off daily in a warm carbolic acid bath; the skin wiped dry and re-oiled; one tablespoonful should cover the whole body except the hair.

During the illness a sheet should be fixed hanging down outside the door and moistened from time to time with permanganate of potash solution 1 to 20, or carbolic acid 1 to 20 (poisonous) of water.

After convalescence all woollen articles, books, etc., should be baked for two hours at 250° F. Iron and wooden articles scalded and washed with soap and water, or carbolic acid and water 1 to 40.

Soiled linen should at once be plunged in a tub of carbolic acid and water 1 to 20, or permanganate of potash (Condy's Fluid) and water 1 to 20, and afterwards boiled for a little time before washing.

The room should be disinfected by chlorine or sulphurous acid, but not by both together. All infected clothes should be hung up separately on a line drawn across the room, the doors and windows closed tightly and a pound of sulphur burnt on a fire shovel. The room should be left so, for 12 hours or more.

CEREBRO-SPINAL FEVER

is very like typhus fever, with painful contraction of the muscles of the neck, drawing back the head. It begins suddenly with shivering, sickness, intense headache, pains in the neck, trunk, and limbs. The fever increases; breathing is quick; the patient is restless and has a look of distress; the tongue is dry, and there may be obstinate vomiting; when there is an eruption it is lighter in colour, comes on sooner and fades sooner than typhus, and is succeeded by peeling of the skin. The sensibility of the surface is great, every touch causing agony. The symptoms increase up to the third day, when swallowing and breathing become affected; the head is dragged back on the neck, delirium, stupor, and death occur from the fifth to the eighth day. The disease may continue three or four weeks and convalescence as many months. The fever frequently lasts for a very short time, but is generally fatal from the fifth to the eighth day.

Treatment.—Full doses of opium and quinine and cold sponging, 20 drops of laudanum, 10 grains of quinine thrice a day till the symptoms yield.

If the nose is involved there is a yellow foetid discharge.

When the windpipe is affected there are hoarseness, loss of voice, and difficulty of breathing.

Dangerous Symptoms.—A quick, feeble, or very slow pulse, difficult breathing, delirium, persistent vomiting. The total duration is about three to fourteen days.

After Effects.—About two to four weeks after, but never immediately, paralysis is apt to come on; most commonly of the palate, causing nasal voice, and fluids enter the nose at the back of the throat, causing difficulty in swallowing, and of the eye,

causing squinting, or of the heart, causing death by fainting.

Treatment.—Nourishing diet frequently given in small quantities. If the pulse is quick and feeble, alcohol, a gargle of glycerin and tincture of iron, one ounce of glycerin to two draehms of tincture of iron; two draehms of tincture of iron to be taken in the drink used in the course of the day.

Inhalation of steam containing vinegar, three ounces of vinegar to one pint of water. Where the windpipe is early affected, tracheotomy.

Convalescence.—Sea air and bathing, nourishing diet, quinine and iron tonics.

RUBEOLA

(*Rötheln, German Measles*)

is an affection midway between scarlet fever and measles in its symptoms, and by many supposed to be a combination of the two, but is probably a distinct disease. One attack of rubeola gives protection from another, but not from scarlet fever or measles; there is little or no fever, and little tendency to inflammation of the lungs or kidneys.

About two to three weeks after exposure to infection the disease appears with running at the nose, watering of the eyes, sore throat, headache, and slight fever (100° F.); on the third or fourth day the eruption appears on the head and face, and spreads to the trunk and limbs, sometimes disappearing on the face before it appears on the limbs. The eruption consists of spots like measles or flea-bites, but much brighter red and more clustered together. The eruption fades about the tenth day, and is succeeded by peeling off of the skin in scales.

Treatment.—Confinement to a warm room, milk diet and sixteen grains of compound rhubarb powder at the beginning of the attack.

TYPHUS FEVER.

(Jail Fever. Camp Fever.)

About eight or nine days after exposure to infection the fever begins suddenly with chills, hot skin, cold sweat, pain in the back, *severe headache*, which ceases about the tenth day, quick pulse, over 100, and fever. Sleep is disturbed and unrefreshing, and when not asleep there is a constant tendency to drowsiness. The tongue is large and coated with white, there is great thirst, and the bowels are constipated. The face is flushed and dusky, the eyes water, the expression is dull, heavy, and stupid, the mind ceases to think, and attention cannot be fixed; the patient lies with his eyes open, but sees nothing, and takes no notice of what goes on around him. There is much restlessness and great muscular prostration, the weakness soon becoming extreme, so that he slips down in the bed. The characteristic eruption, which does not disappear on pressure, comes out from the fifth to the seventh day, and consists of one crop only, which remains out from seven to ten days. It appears as dusky red or mulberry-coloured spots of the size of flea-bites, and a second lighter-coloured rash that seems to be under the skin, the two together giving a mottled appearance. The rash appears first on the back of the wrists and borders of the armpits, and spreads to the trunk and lower limbs. About the end of the first week the headache ceases and violent delirium begins, followed by collapse or low muttering delirium; the prostration increases and is greatest towards morning. The pulse is 100 to 130.

The breath becomes foetid, the skin cooler, and the eruption darker, till on the eighth or tenth day there are blood stains under the skin. The teeth and lips are covered with a crust, the tongue hard, dry, and

converted into a ball. The temperature rises till the fifth day, when it may be 103° F. to 107° F., the morning temperature being always lower than the evening. Muscular weakness is extreme, and the patient pays no attention to external objects, but the mind is active as in a dream, and there may be great mental suffering. About the fourteenth day usually amendment sets in, and the patient has a quiet natural sleep, from which he awakes rational but confused. Amendment or death (when the eruption continues visible on the body) generally takes place between the twelfth and seventeenth days. After the first week there is a peculiar odour compared to the smell of mice.

During convalescence, which is tedious, the mental and bodily vigour slowly returning, the hair and scales of the skin are shed.

Treatment.—Cold sponging and cold bath (see GENERAL TREATMENT OF FEVERS), free ventilation, $\frac{1}{2}$ a grain of quinine with 10 drops of sulphuric acid twice a day, and above all the careful and discriminating use of stimulants, including alcohol, tea, coffee, and extract of beef, especially towards morning. There is no disease which requires more careful and continued watching. Alcohol should *not* be given if there is severe darting headache, noisy active delirium, or strong pulse, or if delirium is increased by its use. But if there is a soft slow pulse, cold extremities, dry brown tongue, or low muttering delirium, and if under its use the tongue becomes moist and restlessness gives place to sleep, it does good. The dose may be two teaspoonsful of whisky or brandy, with the same amount of hot milk, every hour, along with small quantities of nourishing stimulating food, as beef-tea, milk, tea, or coffee.

Differences between Typhus and Typhoid Fevers.

	Typhus.	Typhoid.
Most common	Middle age, 25 to 40.	Young, 12 to 25.
Strength	Prostration extreme by the fourth day.	Weakness not extreme till second week.
Attack	Begins suddenly.	Begins gradually.
Eruption	A dusky rash.	Rose-coloured pimples.
Face	Dusky flushed face.	Bright pink cheeks.
Diarrhœa	Seldom diarrhœa, never bleeding.	Very often diarrhœa, often bleeding.
Crisis	About 15th day.	About 20th day.
Relapse	Relapse rare.	Relapse common.
Death	Death by stupor (coma).	Death by exhaustion (asthenia).

TYPHOID FEVER.

(Enteric Fever. Gastric Fever. Infantile Remittent.)

The whole duration of this fever is usually about twenty-three days, but it varies considerably. About two weeks after exposure to the infection the fever begins gradually by an indefinite feeling of illness, depression, dulness, restless sleep disturbed by dreams, singing in the ears, headache, pains in the limbs, dizziness, and sometimes bleeding from the nose. With the onset of the fever there are chills, shiverings, and pains in the limbs, the pupils are dilated, and towards evening the face is flushed, with

pink cheeks ; the belly is swollen and tender, and on pressure near the right hip gives a gurgling sound.

First Week.—The tongue is at first broad, moist, and coated with white, which falls off leaving bright red stripes down the sides or middle. The pulse is 90 to 100. The patient already feels weak, and lies on his back gazing fixedly and showing no interest in what goes on around him, but on being spoken to after a moment's characteristic pause he answers quite readily. There is great thirst, no appetite, and a slimy or bitter taste in the mouth. The bowels are usually constipated, but sometimes there is diarrhœa. If there is delirium it is generally active, the patient wishing to leave his bed, and living in an excited dream. The temperature is very characteristic till the height of the fever is reached, being two degrees Fahrenheit higher in the evening than in the morning, and one degree lower next morning than the previous evening.

Second Week.—The pains in the head and limbs cease, dizziness and weakness increase, sometimes deafness comes on. The lungs are more or less affected with bronchitis, and confusion of intellect becomes so great that the patient will not help himself to water which is standing beside him, though when put to his lips he drinks greedily. The tongue becomes dry and brown, and the teeth are crusted causing the breath to smell. At the beginning of the second week diarrhœa usually sets in, the stools being of the colour and consistence of pea-soup with the meal at the bottom.

Eruption.—From the seventh to the fourteenth day the eruption appears on the belly, chest, and back, in successive crops of a few pale rose-coloured pimples, which disappear on pressure but return when the finger is removed ; each pimple is of the shape of half a pea, and about the size of a flea-bite. Each crop of pimples lasts three days, and several

crops in successive stages are out together, the whole amounting from tens to hundreds.

Third Week.—The weakness goes on increasing, delirium becomes low and muttering, with picking at the bedclothes and twitching of the muscles. Diarrhœa increases, from three to twenty stools being passed in twenty-four hours. As the patient loses strength, the stools are passed involuntarily in bed. The bladder is apt to be injured by over-distension from not passing water, and should be seen to daily. Bed-sores are very apt to form on the back and buttocks. In fatal cases death is generally towards the end of the third week. In favourable cases about the middle of the third week the symptoms abate, the stupor gives place to natural sleep, and he begins to recognise his attendants, the face becomes paler and not so blue-looking, the cough is stronger, and he is able to expectorate, and the tongue grows moist at the edges and tip.

Fourth Week.—There is slow convalescence, with some confusion of intellect which may last for months.

After-effects.—The bowels are practically always more or less ulcerated (ulcers in Peyer's patches). An ulcer may open into a blood-vessel any time after the first week and may cause fatal bleeding, or the bowel may burst where it is weakened by an ulcer, which is more likely to happen when it is over-distended with food or wind, or in consequence of a fall or blow, and finally an ulcer may perforate through the bowel without any violence. Inflammation of the lungs may occur during the course of the fever, and may prove fatal. Typhoid fever is very apt to start consumption in those predisposed to it. During the fever the body becomes very emaciated, losing 10 to 20 lbs. weight. The progressive rise of temperature in typhoid fever is very marked, and gives valuable information.

Example of Temperature¹ in a severe case of Typhoid Fever.

Day of Fever.	Morning Temperature 8 A.M.	Evening Temperature 8 P.M.
1st day . .	98·6° F.	101·3° F.
2nd day . .	100·2° F.	102·5° F.
3rd day . .	101·6° F.	103·6° F.
4th day . .	102·6° F.	104·6° F.
5th day . .	103·7° F.	105·5° F.

The following temperatures show the disease not to be Typhoid Fever.

Day of Fever.	Evening Temperature.
2nd and 3rd . .	If under 100° F. or above 104° F.
4th, 5th, and 6th . .	If under 103° F.
8th to 11th . .	If under 104° F.
If the temperature of the first two mornings be the same.	
If the evening temperature falls between the 4th and 7th days.	

¹ See page 25.

Indications from Temperature in Typhoid Fever.

Period of Fever.	Favourable.	Unfavourable.
1st week . .	Slight increase of temperature.	Very decided increase of temperature.
2nd week . .	Morning temperature 101° to 103° F. Occurrence of rise of temperature after 10 A.M. and of fall of temperature before 12 P.M.	Continued elevation of morning temperature. Evening temperature of 105.5° or more. Early rise and late fall of temperature.
3rd week . .	Favourable second week. Morning temperature 3° or 3.5° F. less than evening. Evening temperature beginning to sink.	Severe second week. Continued high temperature, when we expect a severe fourth week and even a fifth week. If the temperature remains some time at 107.5° F., or if it suddenly falls to 94° F. or less, we may expect death.

Some cases of typhoid fever (*typhus ambulans*) are so mild that the patient pays no attention to it, or may never discover it till some of its evil after-effects present themselves, such as perforation of the bowel, passing blood, or rupture of the bowel when straining, any of which may cause sudden death.

Treatment.—Is directed to reduce the temperature, to restrain but not to stop the diarrhœa, and to keep up the strength. To reduce the temperature sponging the surface of the body with tepid or cold water is of use. In severe cases the cold bath cautiously used (see GENERAL TREATMENT OF FEVERS) for 10 to 15 or 20 minutes, the temperature at first being 98° F. and cooled down by cold water to 60° F. It may require to be repeated 4 times in 24 hours. Quinine, 2 grains every four or six hours. To restrain the diarrhœa lime-water and boiled milk, equal parts of each, cooled with ice, is both food, drink, and medicine. If the diarrhœa is severe, a tablespoonful of chalk mixture and 6 drops of laudanum, and if this fails an injection of two tablepoonsful of starch mucilage (starch and boiling water) and 15 drops of laudanum may be given twice a day.

To restrain bleeding. Turpentine, 15 drops or 20 drops in honey or yolk of egg given every hour along with 4 grains of gallic acid. If perforation or rupture occurs, the belly suddenly swells and becomes very tender, the patient is pale, faint, and collapsed, and generally dies within three days. Give 2 grains of opium at once, and repeat it every two hours till 6 grains are given. Stop all food and drink except sucking ice for five days or longer, during which time the patient must be fed by nourishing injections of beef-tea and yolk of egg not to exceed 8 tablepoonsful at a time. Apply cold-water cloths to the belly, and renew them every quarter of an hour for the first day and every half hour for the second day.

Medicines.—2 grains of calomel every day for the first four days. After the first eight days half a grain of quinine with 10 drops of sulphuric acid twice a day; if the stomach will not bear this,

3 grains of iodide of potassium and 12 grains of bicarbonate of potash twice a day. If there is much heat and tenderness of the belly, cold-water cloths should be applied three times a day.

Food.—Should be chiefly milk with beef-tea, soups, and beaten-up eggs. It should be given often in small quantities, in very severe cases every hour day and night. No solid food should be given till at least seven days after convalescence has begun.

Nursing.—Is of the utmost importance. Food and drink should be given at regular intervals unasked by the patient, and when there is a crust on the teeth and lips, the mouth should be frequently wiped with a soft wet rag, for which even delirious patients show relief and gratitude. Constant close attention is needed to the cleanliness of the person and linen, otherwise bed-sores are sure to form and be both troublesome and dangerous; threatening bed-sores should be painted with white of egg beaten up with spirits of wine, and an air or water cushion used to relieve the pressure. The bladder should be emptied at least twice a day, and the nurse must make sure that it is so. A tablespoonful of carbolic acid along with a little water should be put into the bed pan each time before use, and the stools should be buried away from running water or wells or well mixed with three tablespoonsful of crude carbolic acid before pouring into a drain; soiled linen should at once be put into a tub of carbolic acid and water, 8 tablespoonsful of acid to each gallon of water, and afterwards boiled and washed.

Convalescence.—Is slow and tedious. The patient is often ravenous, but should get no solid food till seven days after the fever has gone, and not much at a time; the least indiscretion in diet may set up inflammation in the ulcerated bowel, and may cause a relapse, ending in perforation and death. Generally there is some confusion of intellect

left for some time, which may extend to months afterwards.

Differences of Eruption.

Typhoid.	Typhus.
<ol style="list-style-type: none"> 1. Pink rose colour. 2. No change till they fade and disappear. 3. Circular. 4. Separate and few. 5. No mottling. 6. Elevated above the skin. 7. Disappear on pressure. 8. Eruption rarely appears before 7th day. 9. In successive crops. 10. Each spot lasts 4 days. 11. Never on dead body. 12. A large number does not indicate danger. 	<ol style="list-style-type: none"> 1. Dirty pink, soon becoming reddish brown. 2. Gradually darken till they become stains. 3. Irregular. 4. Numerous, in patches. 5. Mottling besides spots. 6. Not elevated except at first. 7. Do not disappear, except at first. 8. 4th or 5th day. 9. Never in crops. 10. Same spots all along. 11. Often persists. 12. Danger in proportion to the amount and darkness of the eruption.¹

Preventive Treatment during Epidemics.—Sewer gases rising up into houses, bad drinking water and milk are the usual sources of infection. We should see that all drain pipes rising into the house are properly trapped and ventilated, but not into the house as often happens, and above all that the escape pipe of the drinking-water cistern does not ventilate the sewer into the cistern chamber. All water used for drinking, cooking, and washing dishes should be

¹ Dr. Murchison.

boiled for some time. All the milk used should also be boiled. Wells into which the surface water gets should not be used for domestic purposes. Horses (and perhaps other animals) are also subject to typhoid fever, and in some otherwise inexplicable cases it seems probable that they may have conveyed the infection, the horse droppings having been soaked by rain into surface wells.

DENGUE.

(*Break-bone Fever.*)

An infectious fever which occurs chiefly in South America and the West Indies.

It comes on very suddenly with fever, weariness, pain in the head and back, and excruciating pain in the joints, which are swollen. In forty-eight hours the symptoms subside, but return to a less degree on the fourth day. On the fifth or sixth day an eruption appears on the whole body, beginning on the head and face and most marked on the palms of the hands and soles of the feet. The colour is intermediate between scarlet fever and measles, or like slight erysipelas. The glands at the back of the head and neck (occipital) are swollen. On the seventh or eighth day the skin begins to peel and the acute stage is over, but severe pains in the limbs may continue for a long time. The symptoms increase and subside several times a day. It is very rarely fatal.

Treatment.—One dose of rhubarb, 16 grains, at the commencement, followed by 4 grains of quinine. Opiates to relieve the pain, such as 2 grains of opium every four or six hours if required.

Convalescence.—Iron tonics, tincture of iron 10 drops thrice a day.

ERYSIPELAS.

About seven to fourteen days after exposure to infection the fever comes on with chills, shiverings, sore throat. The tongue is coated with white and there is a bitter taste in the mouth, with thirst, loss of appetite, sickness and vomiting, but often there are no symptoms till the skin is affected. The affected skin feels hot, tense, and painful, and soon begins to redden and swell. The nearest glands are swollen and tender. The redness is at first clear and speckled, but soon becomes dark and diffuse. The skin feels stiff and brawny to the fingers like thick leather, and the scarf skin generally rises into small blisters. About the third or fourth day the redness begins to fade, the swelling subsides, the pain abates, and the blisters dry up, and the scarf skin peels off in large flakes, even when there have been no blisters. When the scalp has been attacked, the hair falls off, but soon begins to grow again.

During the spreading of the inflammation the temperature rapidly rises to 105° F. or more, the pulse is 100 to 120, and there is often delirium.

The inflammation may be subsiding at one point while it is at its height or even spreading at another. The spreading may either be by extension from a part of the original portion of skin, or it may leave one place and appear at another some distance off. This wandering (erratic) erysipelas is generally very mild in its course, but it may last a long time; weeks or even months.

Erysipelas has been divided into many varieties, but the following are sufficient:—

(a) *Idiopathic*.—When it appears on an unbroken sound skin, generally on the head or face.

(b) *Traumatic*.—When it attacks a wound, it is very apt to occur when the scalp is wounded, or in crowded hospitals with any wound however small.

TABLE OF THE PRINCIPAL CHARACTERS OF THE ERUPTIVE FEVERS.

[To face p. 62.]

	Small-pox.	Chicken-pox.	Measles.	Rubeola (Rotheln).	Scarlet fever.	Dengue.	Erysipelas.	Cerebro-spinal fever.	Typhus fever.	Typhoid fever.
Age chiefly attacked .	All ages.	Young children, under 6.	Children, under 15.	Children.	Children, under 5.	All ages.	Middle age, above 40.	Under 20.	Middle age, 25 to 40.	Youth, 72 per cent. under 25.
Predisposing cause .	—	Youth.	Youth.	Youth; female sex.	Youth.	—	Previous attacks, peculiar	Youth, poverty, male	Want and overcrowding.	Bad drainage and water supply.
Period of latency .	9 to 12 days.	4 to 16 days.	10 to 14 days.	2 to 3 weeks.	4 to 6 days.	3 to 5 days.	3 to 7 days. [constitution.	— [sex.	8 to 13 days.	2 to 14 days.
First symptoms .	Shivering, severe pain in the middle of the back, vomiting, especially in children, fever which falls as the eruption appears.	Headache and loss of appetite, slight fever.	Suddenly; pain in the head, shivering, running of the nose, watery eyes, cough, sneezing, hoarseness, and fever.	Headache, running nose, watery eyes, cough, sneezing, little or no fever.	Sore throat, strawberry tongue, chills, headache, vomiting, especially in children, fever, often severe itching about the body.	Very sudden flushed face, headache, severe pain in limbs and joints, fever.	Fever from 3 days before the eruption to some hours after it, indigestion, chills, sore throat, fever.	Very sudden, vomiting, severe headache, pains of the muscles of the neck.	Dusky flushed face, severe headache, causing on 2nd day stupor, with increasing prostration till patient slips down in bed 4th day, suppression of urine, fever.	Chills, severe headache (forehead), fever, pains in the limbs, and abdominal pain on the right side, fever gradually increasing and worse at night. Temperature rises 2° F. every evening, and falls 1° F. every morning, fever.
Temperature may be .	104° F.	100° F.	101° to 103° F.	100° F.	104° F.	106° F.	101° to 105° F.	103° F.	105° F.	104° F.
Eruption appears .	3rd day on the face, and spreads to trunk and limbs. Pimples which feel hard, on the 3rd day becoming vesicles, on the 5th or 6th pustules, on the 8th or 9th scabs.	12 to 24 hours, appears all over the body, soon becoming vesicles, no central depression, all in one compartment. A fresh crop every day; each crop lasts 4 days.	4th day on the head and face, and spreads to the trunk and limbs. Small raspberry-coloured spots in crescent-shaped patches, rough to the finger.	1st day on head and face, spreads to trunk and limbs, irregular patches of pale red spots, rough to finger.	2nd day on face, neck, and chest, spreads to limbs, minute scarlet spots increase till the skin is lobster red, smooth to the finger.	5th or 6th day, head and face, spreads to body, most marked on palms and soles, darker than scarlet fever, rough to finger.	A dusky red blush, usually on the face, which feels stiff to the finger. At first bright red.	2nd or 3rd day. Eruption frequent in United Kingdom epidemics, is like typhus but brighter in colour.	6th day (5th to 7th). 1. Dark mulberry spots. 2. Lighter mottling, both becoming persistent under pressure.	7th to 12th day. A few (4 to 100) light rose-coloured pimples half pea shape on belly, chest, back, appear in successive crops, each of which remains out 4 days.
Eruption lasts .	11 to 12 days.	10 to 14 days.	6 to 7 days.	7 to 8 days.	5 to 7 days.	1 to 3 days.	Varies weeks to months.	5 to 7 days.	7 to 10 days.	7 to 12 days.
Other symptoms .	Secondary fever begins as pustules form, and at its height when they begin to break: tense burning throbbing pain in skin.	No particular symptoms.	Fever increases till the eruption has reached its height, eyes shun the light, delirium. [during eruption.	Sore throat, symptoms usually mild.	Delirium, drawing the nail along the skin leaves a mark. [nagery during eruption.	Glands at back of head swell, severe pain in joints.	Fever may be very high, 105° F., disturbed digestion, heat, redness, swelling, and tension of inflamed skin.	Tenderness of surface, head drawn back, very unequal temperature.	Low muttering delirium, great prostration.	Beginning of 2nd week headache abates, and loose stools like pea-soup come on, tender swollen belly.
Characteristic odour .	Begins 8th or 9th day.	None.	Odour like pickled goose	None.	Like mouldy cheese or me-	None.	None.	None.	Smell of mice end of first week.	None.
Skin peels .	Scabs begin to fall 14th or 15th.	Scabs fall off about 12th.	Skin peels in scales.	In scales.	In flakes on the palms.	In flakes.	In flakes.	In scales.	Occasionally.	None.
Total duration of fever	14 to 15 days.	7 to 10 days.	11 to 12 days.	10 to 12 days.	7 to 9 days.	About 8 days.	One week to months.	3 or 4 weeks.	13 to 14 days, never exceeds 21.	21 days to 2 months.
Most infective period .	After pustules form.	During eruption.	After eruption.	After eruption.	As skin peels.	—	During skin affection.	—	End of 1st week when smell is	During loose stools.
Most fatal period .	As pustules get fully ripe.	None.	End of 1st week.	Death rare.	5th to 7th day.	—	Ditto.	5th to 8th day.	13th to 15th day. [strongest.	End of 3rd week.
Average mortality .	1 in 3 unvaccinated.	None.	1 in 15.	Ditto.	1 in 3 to 1 in 30 (1 in 7).	1 in 50.	1 in 4 to 1 in 20 ($\frac{1}{3}$ to $\frac{1}{5}$).	1 in 3.	1 in 5.	1 in 6.
Organs chiefly attacked	Skin.	Skin.	Lungs and skin.	Skin and lungs.	Kidneys, skin and throat.	Joints and muscles.	Skin. [of brain.	Brain and spinal cord	Brain and heart. [pneumonia.	Bowels and brain. [ings.
Chief dangers .	Violent secondary fever.	No particular danger.	Cold affecting lungs.	Cold.	Cold affecting kidneys.	After-effects.	Suffocation, inflammation	and muscles.	Coma (deadly sleep), exhaustion,	Perforation of the bowels, bleed-
After-effects .	Pits on the skin, may leave ulceration of the eye or sup-puration from the ear.	Nil.	May give rise to bronchitis, suppuration of ear, pneu-monia, pleurisy, diarrhoea, consumption.	Little or none.	May give rise to kidney disease causing dropsy, ulcerated throat, suppu-rating glands.	Pains in the palms and soles, hair shed, swollen glands. One attack gives no protection.	Abscesses, diarrhoea.	Inflammation of the eye, ear, or chest.	Mental confusion, bronchitis, deaf-ness, swollen glands, diarrhoea, pneumonia, pleurisy.	Ulcerated bowels, confusion of intel-lect, neuralgia, consumption, bronchitis, pneumonia, pleurisy, deafness.

1. *Simple*.—(a) Erratic, (b) Stationary. When the inflammation is superficial and confined to the skin (slight attacks).

2. *Phlegmonous*.—When the deep layers of the skin and tissues under are involved (severe attacks), abscesses generally form under the skin, and the pus should be let out by incisions.

Erysipelas differs from the eruptive fevers in one attack not protecting but predisposing to another. At all ages it is a dangerous and deceitful disease; when it exists along with diabetes or Bright's disease, it is almost always fatal.

It is distinctly infectious, but we cannot always trace the infection to a human being; possibly some of the lower animals may be subject to it, and so carry the infectious germs.

Predisposing Causes.—Wounds of the scalp, exposure to cold and wet, intemperance, previous attacks, old age, weakness, constitutional peculiarity. Idiopathic Erysipelas often attacks persons having to do with bad smells, as sewer cleaners—most often appearing on the nose and eyelids.

When death occurs it is in one of three ways.

1. By stupor (coma). The inflammation spreading from the scalp through the skull to the membranes of the brain.

2. By exhaustion.

3. By suffocation, the inflammation closing the air passages.

General Treatment.—Rest, protection from cold (always cover the affected part with a sheet of wadding; if it be the face make a mask of wool, cutting holes for the eyes and mouth), and a mild purge, as 40 grains compound rhubarb powder and tincture of iron 20 drops, in water every three hours. Always wash the mouth after taking tincture of iron or any acid, otherwise the teeth will be corroded. Good nourishing food, and

where it is required (see GENERAL TREATMENT OF FEVERS) port wine or brandy.

Local Treatment.—In slight cases paint over the surface with flexible collodion or with turpentine. Where there are blisters, dust over the surface with baked flour, and cover it with a thick sheet of cotton wool.

In phlegmonous erysipelas, whenever pus can be felt under the skin let it out by free incisions.

MUMPS.

(*Idiopathic Parotitis.*)

An infectious disease which is most prevalent in cold damp weather. It attacks both sexes before puberty, but boys most frequently, and one attack protects from another.

There usually are slight fever, headache, and loss of appetite for two or three days, when the gland below the ear on one side, rarely on both at first, begins to swell, and the skin over it becomes pale or slightly red. About the sixth day the fever ceases, and in eight or ten days the face appears natural again; occasionally abscess forms in the gland. In girls the breasts, and in boys the testicles, are often swollen and painful.

Treatment.—A gentle purge of sulphate of magnesia (Epsom salts), usually two drachms. Rest. Fomentation of the painful part, and the application of linseed poultices give great relief repeated every three or four hours until the glands get smaller and less painful. Farinaceous diet.

No mustard, turpentine, or iodine to the glands or painful parts.

WHOOPIING COUGH.

Five or six days after exposure to infection the disease begins like a common cold with feverishness, sneezing, cough, and intolerance of light. In about ten days the fever abates, but the cough increases and assumes its peculiar sound or whoop. The coughing fit begins with a long-drawn clear piping sound, followed by a series of short rapidly interrupted expiratory coughs, and succeeded by a long-drawn crowing inspiration which is the whoop, and which alternates with the cough until after recurring several times, when the fit terminates by a quantity of glairy tenacious mucus like white of egg being brought up, or there is vomiting. During the fit the face becomes almost black, the eyes water and seem bursting out of their sockets, and the child seems on the point of suffocation; but soon after it is over the child returns to its play, or if it has vomited, it eats quite readily. A sensation of tickling in the throat precedes each attack, which the child recognises with dread and clings to its nurse, seeks a support for its head, or begins to cry. There may be two or three fits in a day or up to twenty-four or even more.

The disease lasts from three weeks to three months. If it is contracted in the winter, it rarely leaves the child altogether until the warm weather, and when not properly cared for, it may last for a year or longer. The whoop and cough may come back after it has seemed cured for some time, by errors in diet, exposure to cold, etc. Whooping cough may be complicated with emphysema, pneumonia or bronchitis, or convulsions, water on the brain, congestion or diarrhoea, all of which are apt to lead to fatal results. In young children it is almost always complicated with bronchitis and pneumonia,

and becomes a very dangerous disease requiring a great deal of nursing and attention.

Treatment.—An even temperature day and night in a room at 68° F. If the child is old enough to understand, it should be made to repress the cough as much as possible. If the cough is severe $\frac{1}{16}$ grain extract of belladonna, $\frac{1}{2}$ grain of bicarbonate of soda, in a teaspoonful of syrup every four hours. If the child has bronchitis with it, he must be kept in a warm room, and poultices of linseed meal applied regularly to the back and chest every three or four hours.

If there is much vomiting $\frac{1}{2}$ grain cochineal, $\frac{1}{2}$ grain bicarbonate of soda, and a teaspoonful of syrup just before each fit. Change of air has often a very good effect. The most important drug of all is cod-liver oil, which should be given in doses of a teaspoonful twice a day, either alone or with extract of malt after a meal.

The food should be bland and nutritious, milk, stewed fruit, tapioca, etc., but no animal food.

Convalescence.—When it has nearly gone, iron tonics and nourishing diet should be given. Any indiscretion, as exposure to cold, errors in diet, or even strong mental emotion, may re-establish the cough and whoop, even when it has been gone for some weeks; *e.g.*, children supposed cured may have a return of the cough on going a voyage.

YELLOW FEVER

(*Black Vomit.*)

is an infectious continued fever occurring, as a rule, only once during life. The germ of yellow fever is an exotic in Europe, and does not grow when the temperature is below 72° F. It usually prevails in the low-lying districts on the sea coast

of Central America and the West Indies, but it has several times been imported into Europe, where it has run its course and proved fatal. The symptoms vary considerably according to the epidemic, the fever presenting several types.

1st. *Algid*.—The patient while in the enjoyment of his usual health feels suddenly as if struck by a heavy blow on the back, and falls down and dies in a few hours. The surface is cold, the countenance sunken, the eyes dull and filmy, the pulse small, feeble, and quick, and the patient feels cold, depressed, and wretched.

2nd. *Sthenic*.—Chiefly in strong people in the prime of life. There is severe headache and pain in the back, high, full, hard pulse, flushed face, and high temperature.

3rd. *Hæmorrhagic*.—There is heat, pain, and tenderness below the breast-bone, and a tendency to profuse bleeding, *never from one source or organ only*.

4th. *Purpuric*.—There is intense yellow skin, and eyes with large dark patches of effused blood-colouring matter under the skin.

5th. *Typhous*.—There is great prostration of strength and low muttering delirium.

There may be premonitory warning symptoms of loss of appetite, costiveness, flatulence, bright moist eyes, and debility. Two to ten days after exposure to infection the disease begins with chills and flushes of heat, which soon becomes steady fever, higher in proportion to the severity of the previous chills. There is severe headache and pain in the back, flushed face and suffused eyes, which become red and ferrety. The pulse is 90 to 120. The skin feels hot and dry, giving a tingling feeling of heat to the hand, or may be perspiring, dark-coloured, flabby, and even cold. It is usually lemon-coloured or greenish yellow. The tongue is creamy white,

with crimson tip and edges. From the commencement, or a little later, there is sickness and tenderness over the stomach, with vomiting, at first of a clear glairy fluid, but soon becoming dark like coffee-grounds.

The patient craves cold drinks, which are immediately vomited at first, with some pain, but subsequently without effort.

The urine is scanty and high-coloured, and albuminous (see page 352).

The stools are deficient in bile and become black from blood. The mind is disturbed and more or less delirious, the patient becoming restless and vigilant, and disposed to leave his bed if permitted, and having wild hallucinations like delirium tremens. The breathing is oppressed, and often towards the close there is hiccough and wild shrieking, or melancholy wailing. Should the symptoms become alleviated, the pulse becomes slower, delirium subsides, and, above all, the irritability of the stomach ceases; active perspiring, bleeding from the nose, or discharge of bile from the bowels may take place on the way to recovery. If the ferrety eyes whiten, the lips and cheeks become pale, but the delirium and irritable stomach persist, the apparent remission is delusive, and a fatal result threatens.

When the black vomit is plentiful and the urine abundant, the intellect remains clear and unclouded.

Favourable Signs.—Pulse between 100 and 110. even and regular; urine in good quantity, no matter how dark; black vomit and tenderness over stomach lessened or gone; bile green or yellow in stools or vomit.

Unfavourable Signs.—Ficry crimson tip and edges of tongue; very irritable stomach, and very severe headache; a streak of blood in the early vomit. Beginning with a fit of convulsions, black watery

stools with shreds, torpid statue-like face, scanty urine, copious black vomit, faltering speech and difficulty in putting out the tongue, ghastly appearance, and faint nauseous odour.

Differences between Malarious and True Yellow Fever.

Malarious Yellow Fever.	Specific Yellow Fever.
1. Is periodical.	1. Not periodical.
2. Not infectious.	2. Infectious.
3. One attack does not protect from another.	3. Protects.
4. Albuminous urine rare.	4. Almost invariable.
5. Bleeding rare.	5. Bleeding common.
6. Quinine has marked effect.	6. Little or no effect.
7. Exists below 72° F.	7. Does not exist below 72° F.
8. Death rare before 7th day.	8. Common on 3rd day.
9. Convalescence slow.	9. Convalescence rapid and agreeable.

Treatment.—Frequent copious injections of salt and water, one pint of water and a tablespoonful of salt, gumwater or arrowroot, four drops of chloroform before food to allow the stomach to retain it. Free ventilation. No opium when there is suppression or scanty urine; about the fourth day frequent small doses of acetate of ammonia and nitrate of potash (saltpetre). A wet compress, four folds of cotton or linen wrung out of cold water and placed over the stomach, sometimes subdues the vomiting. The crisis usually occurs on the fifth day, the total duration being

three to nine days. The infection is chiefly from the vomit, and the fever is very fatal, one in three usually dying. Malarious yellow fever is not infectious, and comparatively seldom fatal; there are black vomit, black stools, and yellow skin and eyes as in specific yellow fever. Treatment the same as in Remittent Fever, which see (page 92).

PLAGUE

is believed to be a severe type of typhus fever, attended with swelling and suppuration of the glands, and spots of effused blood under the skin. The glands do not open till between the fifteenth and twenty-seventh day, when the fever has declined. It attacks chiefly the poor, weakly people, and women. Plague is always present in Egypt.

Treatment.—Same as Typhus Fever (see page 51).

DIPHTHERIA.

(Putrid Sore Throat.)

About thirty hours or less after exposure to infection the disease begins gradually like a common cold, with depression, chilliness, loss of appetite; in severe cases shivering, sickness and vomiting. There is slight difficulty of swallowing, and the glands at the angles of the lower jaw (bifurcation of carotid) are swollen and tender. Inside the throat the mucous membrane is red and swollen. A whitish grey patch forms on one of the tonsils or some part of the back of the throat, and begins to spread till, either alone or joined to others, it covers the reddened surface and extends down out of sight. At first the greyish patch of false membrane is soft like cream, but presently gets thick and tough and is of the colour of dirty washleather. When it comes off or is dislodged, it leaves a loss

of substance, and under it there is a bleeding surface which is soon covered by a new membrane having a horribly offensive putrid smell.

There are generally three or even four false membranes in succession thrown off in bad cases, and any wound or sore on the body also forms a membrane over it.

If the membrane extends down the windpipe it may cause death by suffocation. If the temperature rises to 105° F. or more, it will probably end fatally. There is a remarkable tendency to paralysis throughout the disease, and still more during convalescence. Death may occur from paralysis of the heart, from exhaustion, or suffocation, the mind remaining clear to the last except in suffocation. The total duration varies from forty-eight hours to fourteen days, but the after-effects may last for months. After convalescence of some days, generally two to four weeks, paralysis may come on, usually of the muscles of the palate, causing nasal voice, and fluids in drinking to run into the nose—more rarely the limbs are paralysed, or muscles of the eye, causing squinting; sometimes of the heart, causing death by fainting.

Treatment.—A tent should be made—*i.e.*, at the four corners of the cot or bedstead, four upright rods should be placed about five feet high each, a covering placed over the top and sides so that the child be entirely enclosed. A steam kettle should be continually kept boiling so that the air inside the tent be warm and moist, temp. 70° F.

Nourishing food should be given in small quantities often repeated, such as beef tea, eggs, milk, and brandy, a teaspoonful every four hours; brush the throat with a saturated solution of boracic acid every two hours; tincture of iron in the drinks used, so that eight full doses of thirty drops each may be taken in twenty-four hours.

Differences between

	Croup.	Diphtheria.	Scarlet Fever.
Most common	2 to 3 years.	3 to 15 years.	Under 5.
Attack begins	Gradually.	Gradually.	Suddenly.
Voice and cry	Shrill. [or clanging.	Dull and nasal.	Usually unaffected.
Cough . . .	Hoarse, loud, ringing.	Usually not violent.	Uncomfortable.
Breathing . .	Loud, sonorous, crowing.	Usually unaffected.	Sore and swollen, back
Swallowing . .	Usually unaffected.	Difficult and painful.	of throat crimson.
Throat . . .	Sore, no visible change till the membrane extends upwards.	Sore, back of throat and tonsils red and slightly swollen.	Strawberry tongue, skin eruption, pp. 60 and 44.
Other symptoms.		Glands below the angle of the jaw swollen.	There may be an ulcer on one of the tonsils, rarely a membrane.
False membrane.	Begins on the windpipe, and extends upwards.	Begins in the tonsils or throat, and extends downwards.	
Removed . .	Leaves a red but not raw or bleeding surface, no scar.	Leaves a raw bleeding surface with foetid breath, leaves a scar.	
Common after effects	None.	Paralysis.	Dropsy.
Common after			

Convalescence.—Fresh air, good food, and bitter vegetable tonics, such as two tablespoonsful of infusion of calumba twice a day, and light bitter beer. The patient should not be allowed to get out of bed too soon; for I have seen fatal faintness when the patients expressed themselves as feeling very well.

Diphtheria is very frequently associated with sewage emanations, and the cause will often be found in the drains or cesspools and imperfect ventilation.

RELAPSING FEVER.

(*Famine Fever. Seven-day Fever.*)

About five days after exposure to infection the fever begins suddenly with chills and shiverings followed by a persistent feeling of heat. There is pain in the forehead, weakness, dizziness, singing in the ears, *severe muscular pains in the neck and limbs*. The face is flushed, the skin hot and dry. There is great thirst, a white tongue, loss of appetite, vomiting, and jaundice. Delirium is rare, though the temperature is very high and may reach 107° or 109° F. The pulse is 100 to 150.

About the seventh day (5th to 8th), when the fever is at its height, a crisis occurs. There is profuse perspiration, sometimes bleeding from the nose, all the symptoms cease, and the temperature falls in a few hours 9° F. or more; from 106° F. to 97° F. The pulse becomes very slow (45 to 50 per minute), and there is danger of death from fainting. After seven days, or about the fourteenth day of the fever, all the symptoms recur, the second attack lasting three or four days, when there is a crisis as before, and the disease usually terminates; but there may be a third, fourth, or even fifth relapse.

It is impossible to say with certainty what fever it is till the relapse occurs. One attack does not protect from another, but it is rarely fatal, not more than five per cent. dying. Predisposing cause is famine and overcrowding.

Differences between

	Relapsing Fever.	Typhus Fever.	Typhoid Fever.
Age . .	All ages.	Middle age.	Young.
Crisis . .	7th day.	14th day.	21st day.
Attack . .	Very sudden with shivering.	Sudden with chilliness.	Gradual with languor.
Temperature before 2nd day.	104° F. to 106° F.	Under 104° F.	Under 103° F.
Face . .	Bright flushed face.	Dull flushed face.	Pale face.
Skin . .	Hot skin, no eruption.	Dusky rash.	Rose-coloured pimples.
Jaundice . .	Common.	Rare.	Rare.
Pain . .	Severe in muscles and joints.	Dull aching like bruise.	Tenderness of belly.
Bleeding of nose.	Common.	Rare.	Common.
Delirium . .	Rare.	Almost invariable.	Very common.
Relapse . .	Almost invariably on the 14th day.	Very rare.	Common.

Treatment.—Rest. Keep the bowels gently open.

Give iron tonics, such as 2 grains citrate of iron and quinine after breakfast and dinner. Iced milk and lime water; tepid sponging, alcohol if required. (See GENERAL TREATMENT OF FEVERS.)

Convalescence.—The fever is very exhausting, and the patient may remain pale and sickly for months, with swelled ankles, weakness, palpitation, noises in the ears, pains in the limbs, dimness of vision, and diarrhœa or dysentery. In severe attacks the hair may fall out and the scarf skin peel off.

BRITISH CHOLERA

(Bilious Diarrhœa)

is much more common in summer, and is usually the result of some irritant in the food or drink, especially unripe fruit and sour wine or beer.

The attack is generally abrupt, vomiting and purging begin and recur in rapid succession. Enormous quantities of fluid are evacuated, tinged green-brown or almost black by vitiated bile. There is severe pain in the stomach and bowels, and there may be cramps in the muscles of the limbs and belly. There may also be hiccough, difficult breathing, exhaustion, coldness of the extremities, with cool perspiration, and even fainting. Fortunately it is rarely fatal, the symptoms usually subsiding next day.

Treatment.—Let the diet be chiefly milk, or if there be much vomiting, equal parts of sodawater and milk. If there be much prostration, a little brandy should be added to the soda and milk. Give a full dose of opium (2 grains), when the stomach has emptied its contents, and a large hot poultice or mustard blister over the belly. If the surface of the body become cold, with prostra-

tion and hiccough, a glass of strong warm brandy and water. Cramps in the limbs may be relieved by friction with the hand.

ASIATIC CHOLERA.

(*Malignant Cholera.*)

About thirty-six hours to three days after exposure to infection it begins, most commonly gradually.

1st Stage.—There may be painless diarrhoea (purging), which may last a few hours up to two days, along with muscular trembling, weakness, and dizziness.

2nd Stage.—Vomiting and burning heat at the stomach, cold perspiration, dreadful cramps of all the muscles. The stools become copious, thin, colourless, odourless, like rice-water. There is unquenchable thirst; feeble rapid pulse, hurried and difficult breathing, extreme restlessness, suppressed urine. The surface becomes blue, and the body seems to shrink visibly. The features become sharp, contracted, and corpse-like, the looks wild and pitiful; the eyes dim, sunken, with a dark circle round; the voice becomes a low and husky whisper. The skin is cold and wrinkled like a washerwoman's hands after a day's washing; if a fold be pinched up it remains so for some time and then slowly disappears. The pulse ceases to be felt, the breath is cold, and the body has a corpse-like smell; collapse, insensibility, and death follow. The two first stages may last from a few minutes to forty-eight hours each.

3rd Stage. Reaction.—If the patient survive eighteen hours he will likely recover; reaction comes on, the pulse rises, the skin gets warm, and fever is set up which may pass into a typhoid form.

Sometimes the attack is very sudden, without warning, death occurring in half an hour or even in a few minutes. Like typhus fever, cholera is extremely fatal to drunkards.

Treatment.—Before the rice-water stools have begun a full dose of opium, 25 minims of laudanum, but not if there are any signs of collapse. For the extreme thirst ice should be given to suck, and no fluids. As a stimulant, camphor in some form (spirits of camphor) has a good reputation. An ice bag placed along the spine has been used with great benefit. Opium should not be given after rice-water stools begin. In the collapsed stage friction with turpentine, and champagne and ice to drink. For diarrhœa astringent injections into the bowel. The first part of an epidemic is generally much more fatal than the last. In one epidemic in India no deaths occurred after camphor began to be administered on the third day of the epidemic. In another, nine out of every ten attacked at the beginning of the epidemic died, while towards the end of the epidemic three recovered out of every four attacked.

It is of great importance to treat every apparently trifling diarrhœa at once by rest, lying down; a warm poultice or mustard blister to the belly, and a tablespoonful of chalk mixture with ten drops of laudanum. If diarrhœa is neglected it may develope in a few hours into an attack of malignant cholera. The stools should be mixed with a tablespoonful of carbolic acid and buried away from wells or running water, if possible, but in towns well mixed with 3 tablespoonsful of crude carbolic acid, and put into the water-closet.

CHOLERA.

Preventive Measures.

1. *Water Supply.*—A bad water supply is one of the chief causes of an outbreak of cholera. Towns in India where cholera formerly raged have been rendered almost free from it, since a supply of good water has been introduced; whilst villages where the old system of using water obtained from filthy wells, connected with cesspools, have the same fierce outbreaks and a worse type of the disease. If the water comes from a reservoir supplying the town, see that it is clear and bright, and free from any smell, etc.

In any case all water should be filtered; and if there is the least suspicion of impurity it should be boiled before using for drinking purposes. All good water supplies have a process of filtration at the reservoirs, still even afterwards there may be some trace of vegetable or animal matter very injurious to health which is rendered harmless by boiling.

But the greatest source of danger is the water taken from wells. It is most deceptive in appearance, being almost always of good colour, and to all outward appearance pure, and yet may contain an abundance of animal and vegetable matter. If you use the water from a well, note carefully the situation more especially with regard to cesspools, for they are the principal source of contamination: if they be within a short distance and shallower than the well, there is certain to be a draining of the contents into the water, thereby causing the water to be most dangerous and totally unfit for drinking purposes. I have often heard owners of wells declare that the water from them was the purest of the pure, yet on analysis it was proved to be contaminated and unfit

for use. One of the largest outbreaks of cholera we had in London was proved to be due almost entirely to contaminated water from a pump: all the houses using the pump water were attacked, whereas the ones that used other water supply escaped. The water from the pump was afterwards found to be contaminated by a neighbouring cesspool.

Of course the water, though an apparently pure supply, should be well filtered and boiled before using for drinking. Stagnant and surface water should be altogether avoided.

2. *Drainage*.—See that your drains, sinks, traps, closets, etc., are in satisfactory condition, that there is no smell arising from them, no gassy odour anywhere in the house, showing a connection with the sewer. Keep all traps clean, and see that no accumulation of dirty water lies outside the doors from soapsuds and greasy water being thrown carelessly down. Use disinfectants freely (chloride of lime, or carbolic acid powder) about the sinks and traps, and in the water-closets, especially if there be one in the house, and flush well always after it has been used. If there be an earth-closet see that it is emptied regularly, and chloride of lime used freely in the pan.

3. Overcrowding is another great evil which should be remedied. Nothing can be worse than too many persons living in one house, breathing the same air over and over again, and, more especially, too many sleeping in one room.

The rooms should be well ventilated, the windows opened at the top and bottom every day, the beds and bedding well aired before being made up for the night. All excretions should be taken out and emptied every morning, and not left to accumulate, as I have too often seen them.

4. During a threatened epidemic a healthy life should be led. The food and drink should be

moderate in quantity, the meals taken regularly, and proper rest taken at night. There should be no excesses; for they weaken the system and make it more easily attacked by any disease. Take moderate exercise in the fresh air every day, especially when confined indoors at work where the atmosphere must get stuffy. Let the clothing be suitable for the season of the year. Be careful of slight attacks of diarrhoea, and treat them before they get serious. It may appear trivial, but if neglected may develop into a serious attack of cholera.

Parcels and letters coming from a cholera-infected district should be carefully disinfected, as germs might easily be carried from place to place by such means.

During an epidemic let there not be any panic. Lead a healthy life, be moderate in all things, attend strictly to all sanitary defects in your house and surroundings, and I think then that cholera, malignant as it certainly is, is not worse than most other infectious diseases.

INFLUENZA.

(La Grippe.)

After the experience of late epidemics of influenza, I think that it should be regarded as an infectious fever as much as scarlet fever or measles. There seems no reason now to doubt that the disease is infectious, and that it may be communicated from person to person, or by luggage or letters sent from infected places.

The sooner this is recognised by the public, and precautions taken by local sanitary authorities to prevent the spread as in other infectious diseases, the sooner will influenza become less the plague than it is at the present.

With reference to the cause of this fever little is known; but it is quite conceivable that it may be due to some spore widely diffused by the atmosphere, and that, under favourable conditions of heat and moisture, it may increase to an enormous extent, and be extensively disseminated by air currents over vast tracts of country.

During the late epidemics all the evidence we have seems to point to an atmosphere impregnated with germs, and that the disease generally spreads most rapidly during mild, muggy, and depressed states of the atmosphere. The invasion of influenza generally is sudden, and large numbers are attacked at the same time, and in distant places almost simultaneously.

This seems to me to point to the theory of atmospheric influence. In moist and damp weather the germs are depressed, and we always find more cases occurring during these periods; but directly the air clears the number attacked rapidly gets less.

Symptoms.—The first symptom generally complained of is a feeling of weariness—everything seems an exertion: there may be a slight headache. A few hours later, when the full force of the attack comes, there are fits of shivering (rigors), a feeling of icy coldness through the body, even though sitting in front of the fire; the head aches as if the forehead and top of the head were coming off, the limbs and body ache as if they had been beaten, the skin feels sore and tender, and the back aches more especially across the loins, at times very severely. The very bones seem to ache.

There is great depression and lowness of spirits, and, in some cases, at the beginning of the symptoms, extreme prostration; the patient feels faint and cannot walk, there is shortness of breath and palpitation of the heart. In some cases the patient is suddenly seized with a severe pain in the back,

running down to the knees, and is quite helpless, although perhaps a few minutes before he was at work and apparently in good health.

After the shivering has lasted a short time the face and body begin to burn, and the temperature rises to 102 or 103° F., in the ordinary case, but at times it may be 104°, or even higher. The pulse is quick and bounding, the skin is hot and dry. Urine high coloured and scanty. There is often delirium. The eyes are often watering, the conjunctivæ inflamed. There may be running from the nose, and sneezing, and sometimes deafness with ringing in the ears. The tongue is covered with a thick white fur, the mouth is dry, and there is great thirst. In the large majority of cases there is a severe cough not associated with bronchitis, and characterised by its harsh dry irritating character without any great expectoration, but very troublesome on account of the straining which causes the headache to increase. The patient is very restless at night, and dozes only for a few minutes at a time, to wake up with a start, suddenly.

In other cases you get symptoms corresponding to a congested state of the digestive organs, viz., vomiting, pain in the stomach, and often diarrhoea, with a furred tongue and great thirst. Directly nourishment is taken the patient feels pain and begins to retch, and vomits all that has been just swallowed. In fact, you may have an epidemic of influenza in a district where the majority of the cases are characterised by the symptoms of gastric disturbance.

Other classes of cases are those where, the symptoms arise from inflammation of the tonsils, quinsy, and inflammation of the larynx, viz., sore throat, difficulty in swallowing, shortness of breath, and croupy dry cough.

In all ordinary cases after from four days to a

week the temperature suddenly drops ; there is profuse sweating ; the headache, pains in the limbs and back are gone, and the patient begins to look himself and to express himself as feeling all right ; but the appetite keeps very bad, and there is great weakness, much in excess of what would be expected from the length of the illness. In about ten days the appetite returns, and the patient begins to sit up ; but the weakness continues for some time even after being allowed to go out, and in some cases for months afterwards.

Very young children seem to enjoy a certain immunity from influenza, or if they have the disease at all it is very mild :—slight feverishness followed by sweating. There is generally little cough but rarely any complication. Very old people are the most severely affected, and it is in these that the disease has been so fatal ; bronchitis nearly always complicating it and causing rapid failure of the heart.

There is a great tendency to relapse, one attack not being any safeguard against future epidemics ; in fact, those who have had the disease before seem more susceptible to the poison and are more likely to be stricken again. It seems to have the power of picking out the weak spots in one's constitution ; *i.e.*, if a patient be neurotic, nervous and neuralgic symptoms are likely to be severe ; or if there be any tendency to catarrh of the digestive or respiratory track, it is sure to be affected by an attack. It is a perilous complication of pulmonary consumption and heart disease, few people recovering from its effects.

In young people and adults under forty-five, the disease of itself is rarely fatal ; but it is so often complicated by other serious disorders that it becomes one of the most alarming diseases we have to contend with.

The commonest complications are those connected with the lungs, viz., bronchitis and pneumonia.

Bronchitis is perhaps the most common; this may perhaps run an ordinary course in young adults, but it has the tendency in elderly people to become broncho-pneumonia, and in consequence much more fatal.

Pneumonia, or inflammation of the lungs, is the worst enemy with which we have to deal. A person depressed with the influenza poison and attacked with a disease serious in itself, like pneumonia is, has not the stamina to withstand it. The temperature is generally higher than in ordinary cases, keeping up above 104° , and the inflammation is inclined to affect both lungs, most often one following the other. The great danger is failure of the heart after three or four days. You seem to get a poisoning of the nervous system in influenza which greatly adds to the danger of any complication.

Other complications sometimes seen are facial neuralgia, rheumatic pains in the joints, delirium, and sometimes mania. Rashes are met with occasionally; but they are mostly accidental, either caused by profuse sweating, or possibly by some of the various drugs prescribed.

Recovery generally is slow, and the strength is rarely as good as before for months afterwards. The blood is rendered poor, and there is a great tendency to take cold. Cough often remains for a long time, and I have seen asthma and chronic bronchitis result from an attack.

Treatment.—First, the patient must certainly go to bed at once; the temperature of the room should be kept at about 60° F., the bedclothes plentiful but not too heavy. As soon as possible after a basin of warm gruel or milk should be given, and with it about five grains of quinine,

which might be repeated in four hours. Several drugs have been puffed as curative agents, viz., antipyrin, quinine, salicylate of sodium, bicarbonate of potash, etc., but their choice had better be left to a medical man, who should certainly be called in if the attack is anything but very slight. There is no doubt that rest in bed and warm nourishment given at short intervals, with quinine in five-grain doses occasionally, will cure the slight cases. The diet should be light and nutritious, such as milk, gruel, beef-tea, broths, egg and milk, Brand's essence of beef, given at short intervals. If there be much thirst, sodawater and milk in equal quantities, or lemonwater, toastwater, barley-water with a lemon and a little sugar in it, will all be found suitable in different cases. Ice might be given to suck. The appetite generally is so very bad, and such a distaste for food exists that great coaxing will be necessary to get sufficient nourishment taken. The great art of good nursing is to bring something different each time, and not to leave any food about the sick room in sight of the patient; let everything be done outside. If there be vomiting, sodawater, or limewater and milk must be given in very small quantities at a time, until the vomiting ceases, and a mustard poultice had better be placed over the pit of the stomach. If the headache be severe, nothing will be found better than cloths dipped in ice-cold water, and applied frequently to the forehead.

For the dry irritating cough a mixture of honey of squills 6 parts, ipecacuanha wine 1 part, paregoric 4 parts, tincture of belladonna 1 part, will generally relieve. In old people free stimulation will be necessary from the first, viz., egg and brandy, or brandy and milk, frequently repeated throughout the day.

The patient should be kept in bed until the

temperature remains normal for at least three days: getting up too soon has been the cause of many a relapse, and very often the last is worse than the first. If the patient appear not ill enough to go to bed, rest in the house should at least be insisted upon, for a slight attack very often becomes a severe one from neglect. During convalescence plenty of good nourishing food should be taken—strong beef-tea, fresh eggs, fish, and lean, fresh meat. A little claret or good port wine will be helpful as blood makers taken once or twice a day. Quinine and iron should be taken three times a day after meals for some length of time, and syrup of iodide of iron, or Parrish's food, with cod liver oil for children. After getting out again, and before resuming business, a change of air will be found the best of all strength revivers.

Preventive Measures.—The most important of preventive measures is the avoidance of all intercourse with those suffering from the disease, or those coming from infected places or houses. Isolation as far as possible should be carried out at the beginning of the symptoms, and continued until the patient is convalescent. Disinfectants (carbolic acid or chloride of lime) should be used freely in the sick room and throughout the house.

All soiled linen from the patient should be disinfected by being placed to soak in carbolic acid or Jeyes' fluid and water (1 in 50), and the discharges from the patient should be thoroughly disinfected before being thrown away. Those in charge of the sick room should be careful to have free ventilation, to take a walk every day in the open air, have regular meals to keep the body in the best of health: by these simple means the resistance to the disease is so much greater than in a person overdone with long nursing and irregularity in living. If the same care were exercised

in the preventive treatment of influenza as is done in scarlet fever and other like diseases, there would not be the large number of cases to record we now have in each epidemic.—

PYÆMIA

(Surgical Fever)

is a specific fever which is usually subsequent to suppurative inflammation of an open wound, especially of the large joints, but it may also occur where there is no wound, as in chronic bronchitis with yellow purulent spit (bronchiectasis, p. 259). It results in the formation of several abscesses in the internal organs, joints, or tissues. About three to five days after the injury the fever generally begins *suddenly*, with shivering and rise of temperature. The pulse is rapid, soft, and small; the countenance dusky yellow and anxious; the tongue becomes dry, and the breath has a sweet mawkish smell like new-mown hay. The patient is restless, sleepless, and in low spirits. Profuse perspiration, with a heavy sickening smell, wandering pains like rheumatism, repeated shiverings, and very high temperature, which rises and falls several times in the course of the day, mark the formation of secondary abscesses. The disease is very fatal, the danger and rapidity of a fatal termination being in proportion to the rapidity and severity of the shiverings. The pus in all the abscesses is infective, and if introduced into the circulation sets up pyæmia. The poison of pyæmia affords an example of a germ which can be cultivated and its virulence increased just as we should cultivate a new variety of potato. The original germ of pyæmia is probably harmless to people in good health, but having once been cultivated into pyæmia is henceforth highly dangerous.

If some pyæmic liquid is introduced into the belly of a guinea-pig it may not produce any very serious symptom, but if some fluid be taken from this animal and injected into another guinea-pig the poisonous strength of the fluid is found to be increased to the most deadly activity; hence epidemics of pyæmia in hospitals were of the most fatal character and were apt to attack the most trivial wound. It is one of the great merits of antiseptic surgery introduced by Professor Lister that it has banished pyæmia from hospitals.

Treatment.—Nourishing food; quinine 4 grains every 3 hours; 10 drops tincture of iron, and 10 drops dilute sulphuric acid thrice a day. Free ventilation, which is also the best preventive.

SEPTICÆMIA

is a form of pyæmia when the fever is intense and the disturbance from blood-poisoning great, but there are no secondary abscesses, and it begins gradually with slight sickness and vomiting, but no shivering. It may result from wounds poisoned by decaying animal matter.

Treatment.—Free exposure to fresh air. Nourishing digestible food, and stimulants at frequent regular intervals. Quinine, 10 grains, repeated in four hours if the fever is not subdued, and again in four hours more if necessary; when the fever is subdued, iron and sulphuric acid should be given thrice daily after food. When septicæmia occurs from a poisoned wound, up to the second day a hot bath (half an hour) as hot as can be comfortably borne, and large doses of alcohol, half a pint (10 oz.) of brandy or whisky per day, have given satisfactory results in the hands of the author.

TABLE OF THE PRINCIPAL CHARACTERS OF THE NON-ERUPTIVE FEVERS (All are Infectious).

(To face p. 88.)

	Influenza.	Whooping Cough.	Mumps.	Diphtheria.	Relapsing Fever.	Yellow Fever.	Cholera.	Plague.	Pyæmia.
Age chiefly attacked . . . Predisposing cause . . .	All ages. —	Under 7. Female sex.	5 to 15. Youth, male sex, cold damp weather.	8 to 15. Bad drainage, cold damp weather, female sex.	All ages. Want, overcrowding.	All ages. High temperature, bad drainage, male sex.	All ages. Bad water supply and drainage.	All ages. Filth, dampness, overcrowding.	Adults. Overcrowding, wounds.
Period of latency . . .	2 days to 2 weeks.	6 days.	14 days (5 to 20 days).	30 hours or less.	3 or 4 up to 16 days.	2 to 10 days.	36 hours to 3 days.	2 to 7 days.	3 to 5 days.
Symptoms . . .	Sudden weakness and general depression, with shivering, cold in the head, headache, cough, fever, or diarrhoea. About the 4th day critical sweating and slow convalescence.	Cold in the head, watering eyes, running nose, with slight fever, lasting 8 to 20 days, which goes off as the cough with whoop comes on; expectoration of tenacious viscid mucus after each fit. If the fits of cough do not exceed 20 in 24 hours, the case is a mild one. If they exceed 40, it is a severe attack.	Slight fever, with swelling and soreness of the gland (parotid) in front of and below the ear, on one or both sides.	Begins gradually with shivering, sore throat, feverishness, hack of throat red with swelled tonsils, on one or both of which specks of false membrane appear and gradually join, becoming like wash-leather; glands of the angle of the jaw swollen, swallowing difficult and painful, breath becomes fetid.	Begins very suddenly with shivering, headache in the forehead, pains in limbs, disordered stomach, often jaundice; about the 7th day, profuse perspiration, temperature falls rapidly (crisis), and amendment; about the 14th day a sudden relapse.	Chills, headache, fever, flushed face, reddened eyes, creamy tongue, skin hot, lemon or greenish colour; irritable stomach and vomiting, at first white and glairy, but becoming black; black stools; pains in the limbs and loins.	Painless diarrhoea, copious vomiting, stools like rice water, great thirst, severe cramps, cold skin and breath, shrinking of the body, sunk eye, contracted pupil, voice a husky whisper, suppression of urine.	Begins suddenly with weakness, shivering, dizziness, fever, vomiting, enlarged glands in thigh or armpit, delirium, purple patches under the skin; glands open 8th to 15th day.	Begins suddenly with violent shivering, fever, rapid pulse, profuse heavy-smelling perspiration, breath smells sweet like new hay, great depression, wandering pains, anxious dusky yellow face, secondary abscesses.
Temperature may be . . .	Varies greatly.	101° F.	101° F.	100° F.	104° F. (102° to 107° F.).	101° to 105° F.	94° to 89° F.	105° F.	104° F.
Total duration . . . Most infective period . . .	7 to 14 days. —	3 to 12 weeks or more. During the cough.	3 to 10 days. While the glands are painful.	2 to 14 days. When membrane is present.	3 weeks. —	3 to 9 days. During vomiting.	— to 2 days. During loose stools.	8 to 10 days. —	4 to 10 days in acute form. —
Most fatal period . . . Average mortality . . . Organs chiefly attacked . . . Chief dangers . . .	— 1 in 40. Lungs, nervous system. Exhaustion, bronchitis, pneumonia.	After first week of cough. 1 in 18. Membrane of lungs. Bronchitis, convulsions.	None. None. Parotid gland. No particular danger.	First week. 1 in 7 (1 in 3 to 1 in 10). Throat, nervous system. Suffocation, exhaustion, paralysis of heart.	— 1 in 21. General. Fatal fainting.	4th to 6th day. 1 in 3. Stomach and bowels. Coma, exhaustion, bleeding.	1st day. 1 in 2 (5 in 6 to 1 in 6). Bowels and stomach. Fatal collapse, exhaustion.	3rd to 5th day. 4 in 5 to 1 in 4. Nervous system, glands. Coma (deadly sleep).	— Mortality large. Wounds or injuries. Exhaustion.
After-effects . . .	Bronchitis, pneumonia, consumption.	Bronchitis, consumption.	None.	Paralysis of the throat, limbs, or heart.	Pains in the limbs, diarrhoea, weakness.	Rapid convalescence.	Secondary fever.	Swollen glands, abscesses, pneumonia.	Abscesses in the joints and limbs.
Peculiarities . . .	More fatal to aged, infants, weakly. Always epidemic.	Very dangerous to infants. Less fatal to girls of those attacked.	Infants are usually not attacked. Pain is more severe in adults.	More fatal to children.	Slow convalescence. Sometimes produces ophthalmia.	1st or 2nd day peculiar corpse-like odour. Negroes seldom affected.	Very fatal to drunkards and aged.	Always present in Egypt and the East.	Most common in overcrowded hospitals.

*PUERPERAL FEVER**(Childbed Fever)*

is a very fatal and contagious fever, allied to pyæmia. Like pyæmia, it may manufacture a poison from ordinary germs, and becomes very contagious; but further, the infection germs of scarlet fever, erysipelas, and measles may give rise to it. It is not a specific fever in the sense that scarlet fever is, but rather a special form of many distinct fevers. From the third to the fifth day after confinement fever with shivering may come on, followed by tenderness over the whole belly or only the lower half. The pulse rises to 120 or more, breathing becomes short and hurried, there is distressing thirst, and often sickness and vomiting. The flow of milk ceases, and the discharges dry up, and there is swelling of the belly with diarrhœa.

Treatment.—Quinine should be given (5 grains) every four hours or oftener if the temperature be very high. The vagina should be syringed out with Condy's Fluid and warm water (1 in 20) twice a day regularly. If there be much pain and tenderness of the abdomen linseed poultices should be applied every four hours.

The room should be well ventilated, and the window opened at the top the best portion of the day. Diet should consist of beef-tea, mutton-broth, milk-gruel, and such like, but if there be vomiting sodawater and milk in small quantities at frequent intervals.

It is extremely dangerous for a parturient woman to come in contact with the infection of scarlet fever, measles, and such like. Puerperal fever is also very contagious, and is easily carried by attendants and visitors though themselves unaffected.

Table of Infections of Fevers.

Diseases.	Infection chiefly in	Infecting power.	Vitality.	Infective distance.
Typhoid . . .	Stools.	Strong.	Strong.	Fluids chiefly.
Cholera . . .	Stools and vomit.	Strong.	Exceedingly strong, not destroyed by boiling.	Ditto.
Yellow fever . . .	Vomit and stools.	Very strong.	Very strong.	Ditto.
Erysipelas . . .	Vapours from skin.	Weak.	Weak.	Short.
Measles . . .	Scales of skin and breath.	Strong.	Strong and tenacious.	Moderate.
Scarlet fever . . .	Ditto.	Ditto.	Ditto.	Ditto.
Rubeola . . .	Ditto.	Ditto.	Strong.	Ditto.
Small-pox . . .	Vapours of skin, breath, and scabs.	Exceedingly strong.	Very strong and tenacious.	Long distance.
Chicken-pox . . .	Ditto.	Strong.	Weak.	Moderate.
Typhus . . .	Vapours of skin and breath.	Very strong.	Weak, easily killed by fresh air.	Very short.
Relapsing fever . . .	Ditto.	Ditto.	Ditto.	Moderate.
Whooping cough . . .	Breath and spit.	Strong.	Strong.	Considerable.
Diphtheria . . .	Breath (throat) and spit.	Strong.	Strong.	Moderate.
Mumps . . .	Ditto.	Very strong.	Moderate.	Ditto.
Pyæmia . . .	Secretions of wounds.	Strong.	Strong.	Moderate.
Puerperal fever . . .	Secretions.	Very strong.	Very strong.	Considerable.

*PUERPERAL EPHEMERA.**(Weed.)*

Its chief importance is from its alarming resemblance to the onset of pyæmia and true puerperal fever. It occurs in low marshy districts, and may be due to the germs which cause ague.

About the seventh day after delivery there is fever with severe and long-continued shivering; there is great depression, the features are contracted, the eyeballs sink back in the sockets, the fingers are shrivelled and livid as in the cold stage of ague, the pulse is feeble but not much quicker. The discharges are arrested; hysteria and delirium are apt to occur. Profuse perspiration generally indicates a crisis, when the patient begins to get well—the discharges return, and the patient gets refreshing sleep.

Treatment.—Warmth, hot drinks, hot bottles, and plenty of bed clothes till the chilliness is gone. Nourishing food, and 2 grains of quinine every day for a fortnight.

*GROUP II.**NON-INFECTIOUS SPECIFIC FEVERS.**SIMPLE CONTINUED FEVER*

is a joint name for several non-infectious fevers having no specific character and lasting from twelve hours to ten days.

Ephemera or Febricula is the name given to the shortest of these fevers where it lasts only from

twelve to forty-eight hours. The fever comes on with a frequent full pulse, white tongue, pains in the loins and limbs, constipation, scanty high-coloured urine, sometimes a slight eruption soon going away. There is also flushed face, severe headache, and occasionally delirium. There is generally copious perspiration as the fever subsides.

Treatment.—Cooling drinks and confinement to bed. (See GENERAL TREATMENT OF FEVERS.)

REMITTENT FEVER.

(Malarious Yellow Fever.)

Like ague, it is caused by malarious poison, but is found principally in the tropics. There is intense headache and a sense of tightness across the forehead, high fever, with frequent irregular increase and remissions, but not a complete cessation between attacks as in ague.

The paroxysm begins in the afternoon and may last all night, when a remission begins and may last eight or ten hours. Each paroxysm lasts for twenty-four or thirty-six hours, and may continue repeating itself from one to three weeks. In severe forms the remission is less marked; delirium, like that of typhus fever and jaundice, is very common, and often vomiting of blood. The many dangerous local fevers of the tropics are usually of this class.

Treatment.—Quinine during the remissions as in ague, 4 grains every eight hours, cleanliness, and removal to a high dry site if possible. Never to sleep on the ground.

	Relapsing Fever.	Yellow Fever.	Malarious Yellow Fever.
Attacks . . .	Poor and destitute.	All alike.	Those living in certain places only.
Protection . . .	One attack does not protect.	Only once.	Does not protect.
Jaundice . . .	More often absent.	Almost constant.	Very common.
Black vomit . . .	Exceedingly rare.	Very common.	Very common.
Delirium . . .	Rare.	Very common.	Very common.
Relapse . . .	Almost invariable on the 14th day.	Very rare.	Common.
Intermission . . .	On the 7th day.	Never intermits.	Remissions in the mornings.
Infection . . .	Infectious.	Infectious.	Not infectious.
Quinine . . .	No effect.	No effect.	Marked influence.
Mortality . . .	Rarely fatal.	Very fatal.	Prolonged, often fatal.
Death . . .	Rare.	Common on 3rd day.	Rare before 7th day.
After-effects . . .	Leaves no special after-effects.	Leaves little after-effects.	Leaves a morbid state (cachexia).
Bleeding . . .	Periodical.	Not periodical.	Periodical.
Convalescence . . .	Rare.	Common.	Rare.
	Slow.	Rapid and agreeable.	Slow.
	Exists at all temperatures.	Does not exist below 72° F.	Exists below 72° F., and yellow skin.

AGUE.

(*Intermittent Fever. The Shakes.*)

This disease is caused by miasma from swamps and low-lying marshy places where there is much vegetable matter decomposing, more especially when it is beginning to dry up. The poison is probably a low vegetable organism which does not multiply in the body and is not infectious. Ague was formerly a very prevalent disease in this country, but since draining has been so thoroughly carried out it has been banished to a few low-lying spots. If the marshes are frozen or completely dried or covered to a considerable depth with water, ague ceases. Exhausting exercise, catching cold, and previous attacks increase the predisposition to take ague.

About two weeks after exposure to the infection a paroxysm or "fit" of ague comes on, consisting of three stages—cold, hot, and sweating.

The fit begins with a feeling of weakness and faintness, the person yawns and stretches his limbs and begins to feel cold and shivering. The cold and shivering increase, the limbs tremble, the lips quiver, the teeth chatter, and the whole body often shakes. The skin becomes pale, shrivelled, and rough ("goose skin"). The features become pale, sharp, and shrunken. The fingers are sbrunken, pale, waxy, have no feeling, and do not bleed if wounded. The surface feels cold, and the internal organs are congested from the blood being driven in. Cough, headache, hurried difficult breathing, and depression supervene, with a painful sensation round the temples and down the back. When nausea and vomiting begin the hot stage soon follows.

After the cold stage has lasted from thirty minutes

to four hours hot flushes begin and gradually extend till the whole body becomes hotter than natural (105° to 107° F.). The face becomes red and swollen, the heart and arteries beat violently, headache becomes severe, breathing is freer, fuller, and slower, and thirst is greatly increased. The hot stage ends by sweating which begins at the armpits and on the forehead, soon extending over the whole body, and is so profuse as to soak the bed and linen. The fever then gradually abates, the headache remits, and the patient falls into a deep sleep, from which he awakes feeling quite well but weak.

There are three principal varieties of ague: Quotidian, when the attack occurs every day; Tertian, when it occurs every third day; Quartan, when it occurs every fourth day; and various mixed types, such as Double Tertian, when there is a fit every day, but only those of every alternate day resemble each other in time of occurrence and duration; Double Quartan, when there is a fit in two successive days and the third day free, or two fits in one day, one in the morning and one in the evening, and two days free, or a fit every day. In all the varieties of Quartan, only the fits on every fourth day resemble each other; and also a form in which the fit seems replaced by periodic neuralgia. Tertian is the most common in Europe, and Quotidian in India. By a continuance of ague the liver and spleen become greatly enlarged (ague cake). the belly becomes swollen, the blood is impoverished, and the countenance becomes yellowish. The tongue is white in the hot stage, clean in the cold and sweating stages. When the disease is about to yield the fit occurs later every day (postpones), but when it is getting worse it occurs earlier (anticipates). The poisonous malaria is most deadly after the dew begins to fall at night and lies low; hence sleeping on the ground floor is to be avoided.

It is movable by the wind, and therefore houses should be built to windward of the swamps in malarious districts. Even a small surface of water for the wind to pass over, such as a running stream, removes the noxious effects, probably by absorption. For this reason swamp water is dangerous to drink, causing malarious fevers. Large leafy trees attract the malarious poison and are very dangerous to sleep under, but a screen of such trees to windward of a house stops the malaria and renders healthy a place otherwise uninhabitable.

Treatment.—Remove from the malarious district if possible. It is of little use to poison the existing crop of germs if fresh ones are constantly admitted.

Cold Stage.—Warm drinks, hot bottles, plenty of blankets.

Hot Stage.—Cooling drinks, sponging with tepid water, light clothing.

Sweating Stage.—15 grains of quinine dissolved in brandy (see Dr. Livingstone's Travels) or dilute sulphuric acid; free use of drink; rest.

Ague.	Fit lasts.	Begins.	Stages.	Intervals.
Quotidian .	16 hrs.	Morn- ing.	Shortest cold stage and longest hot stage.	24 hrs.
Tertian .	10 "	Noon.	—	48 "
Quartan .	6 "	After- noon.	Longest cold stage and shortest hot.	72 "

Intermission.—4 grains of quinine every eight hours for eight days, and afterwards on threatening of a chill. Next best to quinine and sometimes better is arsenic, ten drops of Liquor Arsenicalis

twice a day. In other cases salicin, 30 grains every two hours till given four times. In long-continued convalescence iron is useful; 3 grains of the carbonate thrice a day.

GROUP III.

DISEASES USUALLY TRANSMITTED FROM THE LOWER ANIMALS BY DIRECT CONTACT WITH ANIMAL POISONS (COMPARATIVELY RARE).

GLANDERS

is a malignant fever which attacks animals having an undivided hoof—the horse, ass, and mule—characterised by an inflammation of the lining membranes of the nostrils, which are covered with sores, and from which a highly infectious discharge, at first thin but becoming viscid, proceeds.

Man is also susceptible to it, so that coachmen and grooms are sometimes infected, even through the sound skin, without any wound, when the secretion has lain on it for some time.

Two to eight days after exposure to the infection the attack begins with fever and pain in the joints and limbs like rheumatism. The nose, eyelids, and forehead swell and become red. A thin, foul, bloody liquid flows from the nostrils, causing erosion of the lining membrane of the mouth and palate, which are deep red and covered with ulcers. About the twelfth day an eruption appears on the face, trunk, and limbs, consisting of small pustules preceded and accompanied by profuse foetid sweats, and abscesses form near the joints. In chronic glanders, which may proceed from inhaling a floating bubble of the secretion coughed by the horse, the symptoms are slower and milder.

Treatment.—Acute glanders is fatal before the twentieth day in the great majority of cases, and even in chronic glanders, which may last for months, less than a half recover.

Compound ipecacuanha (Dover's) powder to produce sweating, 12 grains thrice a day, large doses of opium to relieve pain, and 2 grains of quinine twice a day.

FARCY.

Many believe this disease to be a form of the glanders poison. The glands of the horse swell, suppurate, and form sores the secretion of which is infectious.

About three or four days after infection the lymphatics and glands near the scratch or wound become reddened and swell, forming little soft tumours and red threads accompanied by fever. The lymphatic glands throughout the body also swell, forming farcy buttons, suppurate and become open sores, the secretion of which is infectious. There is no swelling or discharge from the membrane of the nose.

In acute farcy more than half die, but in chronic farcy only one in seven on an average.

Treatment.—Same as glanders. 12 grains compound ipecacuanha powder twice a day to produce sweating, opium to relieve pain, and 2 grains of quinine twice a day.

THE GREASE

(*Equina Mitis*)

in the horse is inflammation of the glands of the skin about the heels, usually of the hind feet, causing a secretion with a loathsome smell and passing on to ulceration with deep raw tender cracks having

an offensive discharge. It is the result of gross neglect, and is never seen in a respectable stable, but in the miserable hacks in manure carts, rag-pickers' carts, etc.

In man it causes an eruption of large blebs with a swollen purple base, and fever, rapid pulse, and foul tongue, alternate heats and chills and tremblings. In about ten days the pustules fall off and leave well-marked scars. It is rarely fatal.

Treatment.—Frequent purging with aloes, 4 grains of aloes pill, with 4 grains of carbonate of ammonia, every day. The eruption should be covered with wet cloths or a wet sheet to be afterwards disinfected by prolonged boiling. When convalescence has begun, 2 grains of quinine and two wineglassfuls of sherry daily.

MALIGNANT PUSTULE.

A spreading gangrenous (mortifying) inflammation beginning as a pimple on the skin, the infection of which comes from cattle similarly diseased. The poison in the skin produces first a redness like a flea-bite, which rapidly increases into a pimple and spreads in 24 to 36 hours, the tissues round becoming hard and black. Crops of pimples form round the inflamed ring surrounding the first; the nearest lymphatic glands become enlarged, the breath becomes foetid, and death follows with the symptoms of blood-poisoning (septicæmia).

Treatment.—The first pimple must be thoroughly destroyed by caustic potash or nitric acid, or even a hot iron, before the swelling has had time to spread.

It is rare in this country.

HYDROPHOBIA

is a disease peculiar in the first instance to animals of the dog and cat tribe. It is one of the most dreadful and incurable diseases, but fortunately it is as rare as it is fatal. Where hydrophobia does occur, usually about 4 to 16 weeks or longer after being bitten, the scar of the bite begins to feel stiff, cold, numb, or tingle, and grows bluish red; very soon there is an indefinite feeling of dread and depression of spirits with restless sleep.

There is a spasmodic affection of the muscles of the throat and chest, causing spasmodic breathing, and stiffness and pain of the neck and throat. Suddenly and unexpectedly there is a fit of choking induced by an attempt to drink.

The dread of fluids so characteristic of this disease is entirely due to the dreadful experience of the patient on trying to drink. Solid food can be swallowed at first without causing spasms, but there is distressing thirst and dread of trying to satisfy it, wild wandering countenance, and constant helpless, purposeless restlessness. There is a copious flow of viscid saliva which sticks to the throat like birdlime, and causes constant hawking and spitting from the dread of trying to swallow it. The amount of spit may be taken as a measure of the violence of the disease.

All the senses become highly exalted; any cold to the skin, even a draught of air, a moving of a curtain or any attempt to touch him, causes great agony, almost amounting to convulsions. The same effect is caused by the approach of a light or reflection from a mirror. Hearing is also affected, so that the least noise, especially that of pouring out fluids, throws him into a violent paroxysm.

At length the mind becomes affected. Horror, anxiety, terror, and depression are shown on the

countenance, and fits of a mad desire to tear in pieces whatever opposes him occur, though he may strongly repress it.

The spitting, retching, and vomiting become incessant; intense restlessness prevails, and, falling into convulsions, the patient expires, or a sudden calm occurs and he dies exhausted. Death generally occurs on the second day, the total duration, when there is recovery, being three to seven days. Few recoveries are known, but sometimes approaching symptoms of hydrophobia have suddenly stopped. In some instances fear of the disease induces in those who have been bitten a hypochondriacal or maniacal imitation of hydrophobia.

Treatment is of little avail, but chloroform, hydrate of chloral, and the vapour bath are useful as moderating spasms. The chief treatment of late years has been that of inoculation, practised by M. Pasteur with great success. I have no hesitation in recommending any person who has been bitten by a mad dog to put themselves at once under M. Pasteur, and I think if done soon enough it will be successful in warding off this awful disease.

The infective poison is chiefly in the saliva, and requires to be applied to the broken skin to produce hydrophobia. The proportion of those bitten who escape is always comparatively large. In one instance mentioned by John Hunter of twenty-one people bitten by a mad dog only one had hydrophobia. The part bitten should be cut out or burnt at once, and the clothes which are bitten through disinfected before using again.

A dog which has bitten people and is suspected of being mad should not be destroyed, but looked up; if it is hydrophobia, the dog soon dies, and if not, those bitten have the comfort of knowing the bites to be comparatively harmless.

The first symptoms in the dog, according to Mr.

Youatt, are unusual sullenness, fidgeting, and frequent changing of posture, loss of appetite, and depraved appetite; it laps its own urine, eats straws, litter, and rubbish, has a disposition to lick cold surfaces, such as stone or iron, and is constantly fighting with its paws at the corners of its mouth. *The voice becomes changed*, it has a hoarse inward bark, and another perfect bark ending abruptly in a howl. *There is no dread of water* as in human beings, but constant thirst. The madness may be of a gentle kind, where the dog shows great fondness for all the persons it knows, or it may be fierce and raging, endeavouring to bite every one it meets, and snapping at imaginary foes. Death takes place from exhaustion in four to six days.

CHAPTER II.

CONSTITUTIONAL DISEASES.

(They are all associated with a morbid state of system (cachexia); their course is generally prolonged, and may become persistent or chronic. There is a tendency to repeated attacks or paroxysms during life, and to transmission of the disease from parent to child, but sometimes the child escapes while the grandchild is attacked.)

RHEUMATIC FEVER

(Acute Rheumatism)

is a specific febrile disorder attended with inflammation of the fibrous tissues of the body, especially of the joints and heart. The parts attacked are thickened, and opposing surfaces tend to adhere.

It occurs most frequently between the ages of 15 and 40, and is most apt to attack those having hereditary predisposition or who have had previous attacks. The special blood poison is supposed to be lactic acid which is formed in the body. The attack is usually brought on by exposure to cold and damp, especially by evaporation from wet clothes after severe exertion.

Fever generally precedes the local symptoms for 24 to 48 hours. The complexion is pale and sallow, and the eyes dull and yellow. There is great heat of skin, 100° to 103° F., with copious acid perspiration having a sour disagreeable smell. The pains in the joints are always worse if there is no perspiration.

The pulse is 90 to 100; there is great thirst and constipation. The tongue is white, and the urine is scanty, high-coloured, and deposits a sediment like brick-dust.

Soon after the fever begins the patient complains of pain in one or usually several joints, moderate at first, but which quickly and steadily becomes severe. The affected joints are hot, more or less swollen, and sometimes red, but the degree of swelling and the pain are not always in proportion. At the height of the disorder in severe cases the patient presents a pitiable spectacle; he lies motionless on his back, afraid to move, and dare not even raise his hand to wipe the drops from his brow; even the weight of the bedclothes increases the pain and induces groans and complaints. If he sleeps it is short, and he wakes up with increased suffering. As the disease progresses it attacks joints that have been previously free, and reaches its height in them while it is disappearing from those first attacked (Metastasis). After several migrations it may again attack its original seat, but the most serious migration is when it attacks the heart, which occurs in

less than half the cases of rheumatic fever. The patient's countenance becomes anxious, the breathing distressed and hurried, pain is complained of over the heart, which is increased by pressure, movement, or breathing, and palpitation occurs. The stethoscope or ear applied to the chest may hear a rubbing-to-and-fro sound like creaking leather. In many cases there are no symptoms beyond the sounds heard by the stethoscope. The tendency to attack the heart is greater the more numerous the joints affected. In a few cases there may be pleurisy, inflammation of the lungs or of the brain coverings causing delirium. When the temperature rises to 103° , and the pulse to 120 or 130, the patient is in great danger. The fever generally continues from ten to fourteen days, and the rheumatism from four to six weeks, but it may leave chronic rheumatism which may last for months or years. Relapses are very apt to occur. As a rule, in a person otherwise healthy, it terminates favourably, leaving the patient pale and bloodless.

Treatment.—A single dose of 20 grains of compound jalap powder, to cause free purging, ought to precede the treatment, and a teaspoonful of cream of tartar in a bowl of gruel ought to be given every day to secure one free action of the bowels daily. If the temperature is very high it must be lowered by salicylate of soda 20 grains every four hours, and by the use of the tepid bath; 3 grains of iodide of potassium, with 2 grains of quinine, should be given three times a day. If the joints are very painful, large blisters round the limbs near the joint, but not over it, and succeeded by large linseed poultices, give relief to pain and may shorten the attack. In less severe cases wrap round the joint with cotton wadding covered with gutta-percha tissue or oiled silk. Where the pain

is severe, opium 2 grains every four hours if required, or chloral hydrate 10 grains, is of much use in making the patient comfortable and free from pain.

During the acute stage the diet should consist almost solely of milk, or gruel. When the pain has gone, beef tea and broths should be given; but no attempt should be made to give anything solid until the pain has been free for a week.

RHEUMATISM.

Many different varieties of rheumatism have been described according to the part attacked. The following division will be found practically useful:—

1. **Gonorrhœal Rheumatism** (see Appendix published separately).

2. **Muscular Rheumatism** is usually acute, and entirely disappears after a short duration, but occasionally it remains fixed in some muscles. The pain is tearing or stretching, and is made worse by moving, but diminished by regular pressure supporting and relaxing the affected muscles. It is generally better in the morning after the repose of the night, and increases with fatigue and towards evening; it is usually made worse by cold and dampness, and relieved by dry warmth. The skin over the affected part is not hot, red, or swollen.

(a) **Lumbago.** Rheumatism of the loins is remarkable for its severity and sudden attack; the person suddenly makes a wry face, cries out and places himself in the most peculiar positions to favour the painful parts, often exciting more laughter than pity.

(b) Rheumatism of the shoulders and arms. Stooping and moving the arm are painful.

(c) **Rheumatic headache.** Moving the scalp causes pain.

(d) Stiff neck, erick in the neck. The head is twisted to one side, and movement causes great pain; it is usually caused by exposure to a draught.

(e) Stitch in the side (Pleurodynia). The pain is felt at one point, and there is catching of the breath. Breathing, coughing, sneezing, and bending cause great pain; it may appear like disease of the lungs (pleurisy), but there is no cough, and pressing the finger between the ribs from before backwards causes pain.

(f) Sciatica. See page 190.

(g) Growing pains. Chiefly in the calves of the legs.

(h) Wandering pains are apt to follow acute diseases, especially scarlet fever and dysentery, and in people long exposed to changes of weather, as soldiers and sailors, or in people predisposed to rheumatism without any special cause. It is more especially important to the medical man to recognise them, as if he fails to prescribe appropriate treatment the patient in his contempt for medicine will hasten to try the pure air and good diet of some hydropathic establishment, and then circulate reports of his extraordinary cure, "after having been given over by the faculty" (Tanner).

Treatment.—Rest and warmth to the affected muscles. Overlapping layers of broad strips of adhesive plaster of any kind, spread on doeskin over the affected side, and over all a flannel bandage.

Gentle rubbing of the affected part with a warm hand and a little soap liniment; sometimes a warm bath for ten minutes is of use: the body must be rubbed very thoroughly dry after it, with a warm towel. If the stomach is disordered, 4 grains each of rhubarb and quassia and the bulk of a small bean of bicarbonate of soda at bedtime may be required. For wandering or obstinate pains, half a teaspoonful each of cream of tartar and sulphur. with 10 grains

of guaiac resin, and a teaspoonful of syrup of ginger mixed with treacle or honey, and taken along with a glass of water in the morning.

3. **Chronic Rheumatism** is the most common form of rheumatism. The knee, ankle, elbow, hip, or shoulder joints are those which usually suffer from chronic pain, stiffness, and swelling. It generally attacks only one joint, usually the right knee-joint or very few joints if more than one, and rarely changes from one joint to another as acute rheumatism does. It appears in two forms. In the first form single joints are often for months or years the seat of constant pain which is increased by pressure, but particularly by moving the joint, and severe paroxysms of pain come on spontaneously, particularly by night. If we place the hand on the joint while moving we often perceive a distinct crackling; occasionally the joint is swollen from containing fluid, and the muscles are more or less wasted from want of exercise. The second form, **Synovial Rheumatism**, consists of a series of sharp attacks occurring at short intervals always in the same joint. Persons suffering from this form often become rheumatic at every change of weather, and are possessed of a very disagreeable weather-glass. Attacks may also be brought on by damp feet or a draught. There is slight fever accompanied by perspiration, and the joint is swollen, sensitive to pressure, and painful when moved.

Predisposing causes, *i.e.*, causes which favour an attack of chronic rheumatism, are hereditary influence, previous attacks of any kind of rheumatism, middle age, and general debility. The attacks are usually brought on by cold and damp, especially evaporation from wet clothes after severe work or exercise. It is most apt to attack any part that has been weakened or injured, as a sprained or bruised joint, or the limb that has done most work

and is most fatigued. Prolonged and repeated attacks lead to deformity of the joints, and not unfrequently to dislocation. Rheumatism is generally associated with derangement of the digestive organs.

Treatment.—Rhubarb, quassia, and soda, as in muscular rheumatism, for two successive evenings, then 3 grains of iodide of potassium, and 2 grains of quinine, twice a day, and which may occasionally, say every third day, be varied by guaiac, cream of tartar, and sulphur. The affected joints should be kept at rest and surrounded by a layer of cotton wadding covered by gutta-percha tissue or any waterproof material. The Turkish bath is often of great benefit, especially at first—*provided the heart is healthy*. A course of hot baths may be of much use, but the patient requires to be very carefully and thoroughly dried after each bath. If the joints are very painful, poultices with 20 drops of laudanum sprinkled on them may relieve the pain. Regulation of the food and habits during health is important to prevent repeated attacks. Occasionally rheumatism resists all kinds of treatment for a long time. Flannel should be worn next the skin, and all exposure to damp or damp feet, especially when fatigued, should be carefully avoided.

ACUTE GOUT

is a specific form of inflammation in which as a rule the first joint of the great toe is first and chiefly attacked. Gout may be hereditary or acquired. It occurs chiefly in men who eat great quantities of animal food and indulge freely in malt liquors and wine without taking sufficient exercise. The premonitory symptoms are indigestion, palpitation, constriction of the chest, and profuse perspiration; but they are usually so slight as to attract no special

attention: hence the attack surprises the patient like a thief in the night. After he has gone quietly to sleep he is awakened soon after midnight by a severe burning piercing pain in the first joint of the great toe, immediately succeeded by chilliness, shivering, and slight pain, which abate as the pain increases. The pain rapidly becomes unbearable, the affected joint feeling as if held in a vice, and so exquisitely painful that the patient cannot endure the weight of the bedclothes nor the shaking of the room from a person walking quickly in it; he sighs and groans and is perpetually shifting his foot from place to place. Soon after the attack begins the affected joint swells, and the skin over it becomes tense, red, and shining; there is fever with a full pulse, dry skin, intense thirst, scanty high-coloured urine, and very irritable temper. The pain goes on increasing till evening and does not abate till two or three next morning, about twenty-four hours from the commencement, when the patient falls asleep in a gentle perspiration; the following day the pain is endurable, but becomes worse towards evening. passable days alternating with bad nights for about a week to a fortnight, when the patient recovers. When the fit is going off a violent itching seizes the foot, especially between the toes, and the skin peels off. After recovering from the pain and sleepless nights, the patient generally feels in better health than before the attack; hence a fit of gout was long considered to be healthy, the real reason being that the excess of food and liquor was stopped and the waste of the body increased. At first the interval between the attacks lasts a year or more, according as the patient reforms his habits, takes more exercise and less food, but as the attacks recur the intervals become shorter and tend to deviate from the ordinary type as the gout becomes chronic. The blood contains an excess of uric acid,

which is deposited as "chalk stones" in and around the affected joint, and various local affections are developed, such as flying pains or gouty twinges, a disposition to grind the teeth, daily paroxysms of intense heat of the nose, which is at first bright red, soon becoming purplish, and which lasts for three or four hours—*tic douloureux* and *sciatica*. These affections are always greatest when the stomach is much deranged.

Treatment.—Twenty grains of compound jalap powder, to cause free evacuation of the bowels. Ten drops of colchicum wine and the bulk of a small bean of bicarbonate of soda in a glass of water every six hours. When the pain is severe 8 grains of Dover's powder every four hours. The affected joint should be wrapped in cotton wool or flannel, and a piece of flannel dipped in a warm lotion of twenty drops of laudanum in a wineglassful of warm water may be laid over it.

Cold applications must be avoided, though they often give instant relief, as they may cause the inflammation to leave the joint and attack the heart or brain and produce sudden death.

Chronic Gout.—Chronic gout does not materially differ from acute, but the attacks are longer, the intervals shorter and less perfect, and there is a greater tendency to attack the internal organs. Several joints may be affected at the same time or in succession. The attack is preceded by acid indigestion, flatulence, and confined bowels; restless sleep, palpitation, and perspiration. The patient suddenly feels a blow as if the foot were broken in pieces with a large stick, so that he wakes crying out with pain. The succeeding paroxysms are less painful; instead of the usual external pain, sickness, pain in the belly, and sometimes diarrhoea succeed. The swelling and redness develop more slowly in chronic gout. The redness

is not so intense, and the swelling is more diffuse and softer, and remains after the skin peels. Chalk stones are more common in chronic gout, and after repeated attacks the part becomes thicker by new deposits which cause pain, difficulty of motion, weakness, and deformity of the parts, and may even cause dislocation.

Atonic Gout.—The weak system is not in a condition to develop an attack of ordinary gout. The joints enlarge and the tissues and ligaments are thickened, yet if the patient be kept quiet, he suffers no pain; but is troubled with indigestion, sickness, flatulence, cramps, low spirits, fainting and breathlessness. The slightest causes, as cold, changes of weather, excitement or wrong diet, will bring on these symptoms, sometimes with pain in one or more joints, like a commencing fit of gout.

Retrocedent Gout.—Is when some internal organ is affected on the disappearance of the disease from the joints. Gout in the stomach causes severe pain and violent vomiting; in the brain it causes severe headache, dizziness and vomiting, or like a fit of apoplexy. Gout in the heart causes irregular feeble pulse, breathlessness and fainting; in the spinal cord, paralysis; and in the lungs asthma.

Treatment.—During the fit is the same as in acute gout; colchicum must not be continued for more than three weeks at a time. If gout has shifted to an internal organ, a large mustard poultice over the joint previously affected; during the intervals a moderate allowance of food; meat to be taken only once a day, and all alcohol, especially beer and wine, as well as tea and coffee, are to be avoided; a moderate amount of exercise, and a considerable amount of pure water as a drink, are beneficial. Chronic gout has a tendency to produce diseases of the kidneys. In non-beer-drinking countries gout is almost unknown among the lower orders.

*Differences between Gout, Rheumatism, and Osteo-
arthritis.*

Gout.	Rheumatism.	Osteo-arthritis.
1. Strongly hereditary.	Less so than gout.	Less still, if at all.
2. Much more frequent in men and the better classes.	As frequent in women.	More frequent in women and poorer classes.
3. Usually begins between 30 and 35.	Usually begins 16 to 20.	Usually begins 30 to 40.
4. Caused by high living, wines, and beer.	In the weak, from cold and damp.	From depression.
5. Small joints are more affected.	Large joints are more affected.	Large and small joints equally.
6. Local symptoms severe. Skin peels afterwards.	Less severe. Skin does not peel.	Less pain, much swelling.
7. Causes nervous depression of the heart.	Often causes inflammation of heart.	No tendency to cause heart disease.
8. Fever moderate.	Fever great.	Fever small.
9. Fits periodic in early attacks.	Not periodic.	Not periodic.
10. Early attacks last 7 to 10 days.	Usually much longer.	Indefinite.
11. Blood contains uric acid.	Lactic acid.	No acid.
12. Chalk stones deposited externally or internally.	No chalk stones.	No chalk stones.
13. Often causes disease of the kidneys.	No tendency to kidney disease.	No tendency to kidney disease.
14. Associated with derangement of the primary digestion.	Associated with derangement of the secondary digestion.	.

Dr. Garrod.

CHRONIC OSTEO-ARTHRITIS

is characterised by pain, stiffness and deformity of one or more joints, with deposition of new bone round them. The joint becomes swollen and misshapen, the cartilages on the ends of the bones disappear, leaving a smooth hard surface like porcelain. The disease developes slowly, usually between the twentieth and fortieth year; a halt may occur in its progress, but never a disappearance of the existing deformity. The disease generally begins in both hands and passes to both feet. There is slight pain in the affected joints, which is increased by pressure or by motion, and if the hand be laid on it while in motion, a crackling is felt, the joint containing little or no synovial fluid. The fingers are drawn to the little finger side of the palm, and overlap each other like the slates of a house. Patients with this disease may attain extreme old age.

Treatment.—It must not be treated either as gout or rheumatism. Warm baths, 10 grains of Dover's powder at bedtime to promote action of the skin, good diet and a moderate allowance of wine, 4 grains daily of citrate of quinine and iron, and a tablespoonful of cod-liver oil. Warm clothing and occasionally painting over the affected joint with iodine.

CANCER.

Cancer, in the popular sense of the word, includes malignant tumours, and may be defined as a deposit or growth that tends to spread indefinitely in the surrounding tissues, and to reproduce itself in remote parts of the body; a continual feverish state (cachexia) and increasing wasting are set up; the face becomes pale and anxious, with a slight

leadened or dirty yellow hue, the features become pinched, and have a sunken cadaverous look, the pulse becomes frequent, and the pains are severe. At length there is nausea, impaired digestion, and a tickling cough, severe darting pains shoot through the affected part, the breathing becomes hurried, and death occurs. There is a marked hereditary predisposition in more than a third of cancer cases. The following are the principal varieties of cancer.

Scirrhus or Hard Cancer.—Is the most frequent form of cancer, and is common between the ages of forty-five and fifty. Its favourite seat is the female breast; it may last from six months to twenty years or more, but as a rule it terminates fatally within four years after it is first observed. It has two stages, a hard stage and a stage of softening. It is usually discovered accidentally by the patient, as a hard firm lump in one breast, which gives no pain, is freely movable, and excites uneasiness only by its continuing to grow, but sometimes there are darting pains from the first. After a short time it ceases to be freely movable, from dragging in and absorbing surrounding tissues; presently the surface becomes knotty, the nipple is drawn in and sunk, the superficial veins are enlarged and tortuous; the skin becomes a purplish red, stretched, and shining. Ulceration begins as a superficial crack or small ulcer, and rapidly increases, causing a deep ragged sore with turned-out edges, the discharge of which is irritating, thin, bloody, profuse and foetid; sooner or later the neighbouring lymphatic glands become affected, and secondary cancers appear in the internal organs. There are often hard lumps in the breast, and sometimes accompanied by darting pain, which are not cancer, but are due to chronic inflammation of a gland which becomes hard and excites uneasiness, especially if accompanied by neuralgia of the breast.

No time ought to be lost in seeing a skilful surgeon in such cases, to make sure that it is not cancer.

Treatment.—Removal by a skilful surgeon before the glands are affected and while it is still movable. Charcoal poultices to the ulcer or chloride of zinc lotion, with morphia injections to subdue the pain. There are many varieties of hard cancer.

Medullary or Soft Cancer.—Generally attacks the solid internal organs or bones, and is rare in the breast. It is the only cancer which is common in early life. Death generally happens within two years of its first occurrence. The general symptoms (cachexia) are the same as in hard cancer; when ulcerated it protrudes in large masses, which bleed copiously; there may be little pain, or it may be very severe according as the cancer occurs in yielding or in firm tissues.

Treatment.—But little can be done for this form of cancer. When removed, cancers are apt to spring up and enlarge in all directions. Treatment must, as a rule, be limited to relieving the symptoms; occasionally, but very rarely, both hard and soft cancers are spontaneously cured, the pressure caused by their rapid growth kills them, and they are cast off, or they may dry up and become absorbed. Cancer is rarely seen in consumptive people; and consumption coming on often stops cancers.

Epithelioma.—Is a form of cancer which occurs almost solely on the skin and mucous membrane. Its usual seats are near the orifices of the body, particularly on the lips. When once it has commenced its tendency is as fatal as the other forms, but it remains much longer quiescent. It is often caused by long-continued irritation, as a short hot pipe in cancer of the lower lip, and by the contact of soot in chimney-sweepers' cancer.

It commences as a small hardness, pustule, or wart, or as a little scab, which soon becomes

ulcerated leaving an irregular open sore, with grey or bloody base, or it is covered with crusts, and from the edges a foetid thin discharge exudes. accompanied by burning pain and general cancerous symptoms. It tends to infect the neighbouring lymphatic glands, and death is by exhaustion or from blood-poisoning.

Treatment.—Early excision, which may be a complete cure. When far advanced, belladonna plaster round it, and opium to soothe the pain.

LUPUS

is a spreading destructive inflammation of the skin, of the face usually. It is most common between the ages of ten and twenty, in badly nourished scrofulous people. There are two varieties.

Chronic Lupus.—It appears as a glistening pimple or pimples, which are covered with detached scales, and can be easily made to bleed; the scales form scabs which grow thicker and broader, and may ulcerate underneath, leaving a white shining scar when it heals. The disease is very obstinate, and may last for months or years.

Spreading Lupus (*credens*).—In which the nodules ulcerate and form deep, comparatively large and rapidly spreading ulcers which may be healing at one part and increasing at another.

Rodent Ulcer.—Is a disease that usually begins from one nodule, and forms a very deep and destructive ulcer of an irregular circular shape of a dull yellowish red; the base is dry and shining, and feels tough and hard, while the surrounding skin is healthy; it usually occurs in the latter half of life.

Treatment.—When there is destructive ulceration, the ulcer must be destroyed by excision, or some strong escharotic, such as nitric acid. In all the patient should have pure air, nourishing food, cod-

liver oil 4 tablespoonsful daily, and iron, 12 grains of the carbonate, twice daily after food. If there is a syphilitic taint, 10 drops of Donovan's solution of arsenic twice a day after food.

LEPROSY

is a constitutional non-contagious hereditary affection of a chronic nature, showing itself as shining dusky red tubercles of different sizes. The skin is thickened, wrinkled, rough, greasy, divested of hair, and the perspiration highly offensive; the skin loses feeling, and there is a tendency to ulceration, from which the fingers and toes or hands and feet may drop off. The eyes become fierce and staring, and the voice hoarse and nasal.

Treatment.—Attention to the general health, bathing, preparations of iron and iodine, internally, gurgun oil, and lime water externally.

SCROFULA.

(*Struma : King's Evil.*)

SEE CONSUMPTION AND INDIGESTION.

(Pp. 140, 205, 268, 274, 276, 289, 340.)

Is a morbid state of the system characterised by a remarkable liability to low forms of inflammation of the glands, joints, ears, membranes of the eyes, skin eruptions, and a tendency to produce tubercle causing consumption. Scrofula may be either hereditary or acquired; in both cases the primary disorder is a certain kind of dyspepsia. Acquired scrofula is generally the result of improper food, impure air, and want of sufficient exercise. Feeding infants solely on pap instead of milk is a frequent cause. Hereditary scrofula may be due to the parents being

scrofulous, or suffering from cancers, consumption, or some other malady, and presents two types. In one there is an unusually large head, coarse features, and thick chin, a hard swollen belly, enlarged glands in the neck, and flabby spongy flesh; in the other the skin is of remarkable whiteness and reddens easily, with blue veins visible through it; the lips and cheeks are deep red, and the white of the eye is a pearly bluish-white, giving a swimming appearance to the eye; the muscles are thin and soft, the features are finely cut, the teeth long, narrow, and bluish-white, and the hair is soft and usually light-coloured. Children of this type are unusually intelligent and precocious, often beautiful, physically, mentally, and morally, and usually die young of consumption—"whom the gods love die young." The most usual effect of scrofula is to cause slow painless inflammation of the glands of the neck which suppurate, and the pus perforates through the skin, leaving an ulcer which heals with great difficulty. The pus is thin and watery and contains flakes of curd-like appearance. The progress of scrofula is tedious and treacherous, and is marked by periodical alternations of improvement and aggravation, often resisting treatment for a long time.

Treatment.—For scrofulous infants a wet nurse, or, if that cannot be procured, cow's milk and no pap. For others than infants, 1. A supply of pure fresh air. 2. Active exercise in the open air. 3. A mild uniform climate, dry soil, and pure water. 4. Flannel next the skin. Waterproof coats and boots or shoes should be avoided. 5. Sufficient regular sleep. 6. Bathing or sponging of the body. 7. Milk should be a great part of the food. If there is enlargement of the glands, cod-liver oil 2 teaspoonsful daily for three weeks at a time, and then a week's intermission if it requires to be continued. Iron in some form should be given regularly. For

children the Syrup of the Iodide of Iron or Parrish's Food three times daily. Iodide of potassium 4 grains daily for a week, and then a week's intermission. Any complications must be treated separately. There is very little power of resistance to disease in the serofulous state.

RICKETS

is a constitutional disease peculiar to early childhood which usually begins between the seventh and eighteenth months after birth and appears when the child begins to walk. The bones as they grow remain soft like gristle from the earthy salts not being deposited. It is preceded for several weeks or months by an unhealthy state of the system often shown by a form of indigestion and yeasty diarrhoea. Rickets is sometimes hereditary, but is most often caused by improper food—such as giving an infant under 6 months one of the starchy foods so often used by mothers,—as boiled bread, biscuit, or any biscuit food instead of the only natural food, milk. But the malted food of Mellin's or Benger's might be given. It is most common among the serofulous children of the poor. The first symptom showing that rickets has succeeded the diarrhoea and wasting in infants is the pain they suffer when they attempt to move their limbs or when they are moved by any one. "Children whose greatest pleasure had been to kick out their legs and put their toes in the mouth, lie quiet, with their thin legs held straight out as if afraid to move; they cry at every motion, and whimper for fear of being taken out of bed, when persons they had formerly loved approach them." If the disease end in recovery, the first sign of improvement is a decrease of emaciation, the loose skin fills again, the wrinkled old face becomes smooth, and the protuberant belly becomes smaller.

Curvatures and partial fractures are most likely to occur when the child is recovering and sits up in bed, or attempts to walk. Older children do not suffer pain, nor is rickets preceded by dyspepsia in them.

Treatment.—Pure fresh air. The food should be chiefly milk plain or boiled with a fourth part of limewater added. Once a week a dose of rhubarb, soda, and calumba ($1\frac{1}{2}$ grain of each) for a child under one year old, a teaspoonful of cod-liver oil daily; if any oil passes by stool the dose should be diminished or suspended for a time. To guard against curvature of the bones high pillows and feather beds should be avoided; sitting up in bed for any length of time and running about should be forbidden. When convalescent 2 grains of the phosphate of iron daily.

Osteomalacia.—Bones which have been hard soften from reabsorption of the lime salts. It is a rare disease, and occurs chiefly in women after confinement. It comes on with boring, tearing pain in the loins and great pain on moving, and is exceedingly fatal. Treatment is confined to preventing distortions.

CRETINISM.

A form of idiocy associated with imperfect development and deformity of the bodily organs, especially the head, and having a close connection with goitre (which see, p. 235). Cretins are of small stature and have a large head flattened at the top. The countenance is vacant, the mouth gaping and slavering, the tongue protruding, the speech defective, and in complete cretinism deaf-muteness and deficiency of general sensibility with absence of reproductive power.

Treatment.—Improve the general health, mental training, and moral control.

DIABETES

is a constitutional disease characterised by an excessive discharge of pale straw-coloured urine containing more or less sugar, excessive thirst, and progressive emaciation. It occurs more frequently in men than in women in the proportion of three to one. The beginning of the disease is generally gradual and unobserved; there is a sense of general discomfort with constant thirst and increase of urine, the patient having to rise several times in the night to make water; the general health begins to give way, and the thirst becomes intense; there is a constant sense of sinking at the stomach, the appetite is voracious or capricious, the skin harsh and dry, and the patient becomes greatly emaciated and loses sexual desire and power. The extremities are cold with a sense of burning in the hands and feet, the bowels become costive, and the stools hard and dry. The breath has a peculiar faint smell like apples.

In advanced cases there is increasing weakness; the bones of the gums are absorbed, and the teeth, loosened in their sockets, are apt to fall out. There is a tendency to the formation of cataract in the eyes, or to the formation of boils, and in many cases consumption of the lungs. The average duration of diabetes is about three years, complete permanent cure is rare. Many patients pass a pound or even two pounds of sugar daily in the urine, so that in a few months they will pass their own weight of sugar.

Tests.—The density of diabetic urine varies from 1030 to 1050, healthy urine being 1015 to 1025. The specific gravity is most easily taken by a little glass instrument called a urinometer, which is set floating in the urine, and the level of the urine on the stem read off gives the density; in distilled

water at 60° F. it should float at zero, and each degree represents an additional thousandth part by weight in the same bulk of fluid, distilled water being taken as 1000.

For chemical tests a test tube and spirit lamp or gas flame are required. 1st, fill about an inch of the test tube with the suspected urine, and add an equal bulk of caustic potash solution and boil it, when if sugar is present the liquid becomes a dark sherry colour.

2nd. To about an inch of urine in the test tube add a few drops of solution of sulphate of copper and a little caustic potash solution, and apply the flame to the upper part of the fluid by inclining the tube. If there is sugara yellowish-red precipitate is formed.

3rd. Potassio-tartrate of copper also gives this precipitate. All the foregoing are occasionally liable to failure, therefore it is well to try more than one.

4th. Fix a piece of dry German yeast in a test tube and fill it with urine; invert it over a small dish of the urine and let it stand in a warm place; if there is sugar, fermentation goes on, gas rises, and the urine falls in the tube. The tests for sugar should be tried several times at intervals, as it may be merely a temporary constituent of the urine. As a rule the second test will be sufficient.

Treatment.—Is chiefly dietetic: abstain from all food containing sugar or starch. The food should consist of meat, eggs, fish, shellfish, green vegetables (not blanched), such as lettuce, spinach, watercress, artichoke, cabbage, and bran bread, gluten biscuits, with skimmed milk; if desired very weak brandy and water may be used. Sugar, pastry, confectionery, potatoes, carrots, turnips, parsnips, beetroot and radishes, as well as rice, sago, tapioca, etc., should be avoided.

As diabetic persons are very apt to take cold and have inflammations, especially of the lungs, the

clothing should be warm and flannel worn next the skin. Regular exercise should be taken in the open air. Opium may be required as a sedative in one-grain doses night and morning, or half-grain doses of codeia may be successful.

Diabetes Insipidus.—The symptoms are the same except that there is no sugar in the urine, the specific gravity of which is about 1005, and which is passed in great quantity, from ten to thirty pints or more in 24 hours. The treatment should consist of cod-liver oil, 2 table-spoonsful daily, and iron, 4 grains of the carbonate, with ordinary good food and warm flannel clothing.

PURPURA.

Purpura is a disease characterised by small purple spots of effused blood under the skin, which are not effaced by pressure and unattended by fever. General disorder of the constitution precedes the appearance of the spots; there is oppressive weariness, faintness, and gnawing pains at the pit of the stomach; the appetite is weak or there is a craving for food, which lies like a weight on the stomach when eaten; the tongue is yellowish and the complexion pale or bloated with swelling below the eyelids. There is often giddiness, palpitation, and constipation of the bowels. When attended with bleeding from some mucous surface, as the nose, it is called hæmorrhagic purpura.

The cause is not known.

Treatment.—Milk, fresh fruit, and animal food; quinine, 2 grains daily, and turpentine, 8 drops twice a day.

Hæmorrhagic Diathesis.—Hæmorrhagic diathesis is a peculiar state of constitution, when the most trifling wound or scratch is liable to give rise to profuse and even fatal bleeding. It is

generally hereditary, and is usually accidentally discovered, as by drawing a tooth causing severe and dangerous bleeding.

Treatment.—The only treatment of any avail is to avoid wounds and improve the general health, when it may possibly be outgrown.

Differences between Purpura and Scurvy.

Purpura.	Scurvy.
1. Eruption is early, bright in colour.	1. Eruption usually does not appear till some time after the other symptoms.
2. Gums are natural.	2. Gums soft and swollen.
3. Limbs are not swollen and painful.	3. Painful swelling of the limbs and joints.
4. Not cured by fresh vegetables and lemon juice.	4. Cured rapidly by fresh vegetables and lemon juice.
5. Pale or bloated face.	5. Pale, sallow complexion.

SCURVY.

(*Scorbutus.*)

Is a complex morbid state caused by long-continued privation of fresh vegetables or their juices, and aggravated by cold and damp, great fatigue, and despondency of mind. The earliest symptoms are a sallow dusky hue of the skin, particularly of the face; wandering pains in the limbs, weariness and depression of spirits. The eyes are sunken and surrounded by a bluish ring. The gums become soft, spongy, and swollen, and bleed very easily. A small purple eruption, like flea-bites, comes out on the lower limbs, and the slightest pressure or blow causes an extensive bruise. As the disease goes on large yellow patches which become purple

appear under the skin of the legs and thighs, especially near old scars; the skin feels rough and dry with raised scales like a newly plucked fowl, and perspiration is diminished or suspended. The purple spots tend to form ulcers, old sores break out afresh, and even the joinings of bones which had been fractured are dissolved. The tongue is white, broad and flabby, the breath offensive, and the stools pale. The teeth become so loose that they may fall out, and profuse bleeding occurs from the gums, nose, mouth, stomach, or bowels. Death may occur from diarrhœa, dropsy, or bleeding.

I have seen scurvy in the west of England in harvest workers who had been six weeks from home and who lived chiefly on bread, bacon, and tea, without vegetables or fresh meat. The gums were swollen, in one ulcerated, and chewing caused great pain. The disease rapidly subsided after an addition of fresh milk and lemons to their dietary.

Treatment.—Lime or lemon juice, fresh fruits, milk, cresses, juice of raw potatoes and onions—see Dana's "Two Years before the Mast." All ships should carry good lime juice, as preserved vegetables have not the virtue of fresh ones.

ANÆMIA

is a morbid state of the blood, which becomes thin, watery, and deficient in red blood corpuscles. It seldom occurs alone, but is generally caused by some other affection. The lips and gums are pale and bloodless; the face is pale, waxy, and blanched in appearance; the small blue collapsed veins are very obvious through the pale skin; the hands and feet are cold, the circulation is feeble, and the heart's action irregular, producing palpitation; a humming sound like a top may be heard in the jugular vein in the neck, and murmurs may be

heard over the heart, caused by the thinness of the blood: for the same reason water splashes while syrup does not.

Partial dropsies (œdema), causing swelling of the feet, headache, and fainting, are very apt to occur, and the patient is usually thin, weak, languid and in low spirits. Indigestion (which see) is apt to come on from want of proper blood to supply the digestive juices. Bright's disease, cancer, and suppuration are causes of persistent anæmia.

Treatment.—Remove the cause if possible; give nourishing food, change of air, exercise, and iron—10 drops of tincture of iron (Tinct. Fer. Perchlor.) in a tablespoonful of infusion of quassia twice a day after food; for delicate stomachs which will not tolerate tincture of iron, give 3 grains of lactate of iron, or 2 grains reduced iron, twice a day after food. For indigestion, 6 to 12 grains of pepsine with each meal. As constipation is nearly always troublesome 1 compound aloin pill should be taken every morning first thing (Sir A. Clark).

CHLOROSIS.

(*Green Sickness.*)

is a peculiar form of anæmia affecting young women about the period of puberty. The skin, lips, and gums are very pale, a pure white in blondes and a greenish or yellowish waxy appearance in those of dark complexion. The paleness of the skin is often best seen in the ears, which look like pure white wax. *The fat under the skin is normal in amount or even increased, and there is no great tendency to watery swellings (œdema).* Hence moderate paleness of the surface and swelling of the feet show anæmia and not chlorosis. The red corpuscles of the blood, which are the carriers of oxygen from the lungs, are reduced to one-half of

their proper number or less; hence there is shortness of breath, which is increased by exertion, because it increases the formation of carbonic acid and causes hurried breathing to get rid of it and to supply oxygen. For the same reason there are cold hands and feet, chilliness of the body and even cold breath, because enough food or tissue cannot be burnt in the body to supply sufficient animal heat owing to the difficulty in supplying oxygen. Our bodies are slow combustion stoves which burn food with the same result as an ordinary fire, viz., they produce carbonic acid and water vapour with some half-burnt food (urea, uric acid, etc.), comparable to cinders, and from the same amount of food or fuel they extract equal quantities of heat; hence the reason why diminished oxidation (food may be taken into the body and not used) causes coldness of the extremities, etc., and also why a man doing hard work or exposed to severe cold requires more food, especially fat food—oils burn best. In chlorosis the patient is weak, languid, and easily fatigued. She suffers from false rheumatic pains and excessive nervous irritability, neuralgia, a disposition to weep, etc., from deficient oxygenation of the blood. There is excessive sensibility of the skin, the appetite is deficient or depraved, the pulse soft, slow, and feeble, urine abundant and light-coloured, and the *monthly flow absent or disordered*. There is a humming sound in the veins, and she suffers from palpitation. Chlorosis is never dangerous in itself, but it is apt to be accompanied by chronic ulcer of the stomach (which see, p. 306).

Treatment.—Change of air; good food; bathing; milk, and one quarter of lime water; beef-tea; soups; 2 grains of quinine daily, and above all iron, 6 grains of reduced iron, which favours the formation of the red blood corpuscles, three times

a day; or 3 to 5 grains of sulphate of iron thrice a day, along with an equal weight of carbonate of potash, after food.

GENERAL DROPSY.

(*Anasarca*.)

Is an accumulation of watery fluid in the meshes of the tissue below the skin; it usually begins in the feet and ankles or beneath the eyes. It pits on pressure, that is, retains a depression for some time after the finger is removed, and is usually associated with bloodlessness. The treatment is according to the cause. (See HEART DISEASES, p. 227, and KIDNEY DISEASES, p. 342.)

Generally the following mixture is of use, but must not be used if there be inflammation: Syrup of squills and juice of broom tops (*succus scoparii*), of each an ounce and a half; spirits of nitric ether, half an ounce; tincture of digitalis, 2 drams; acetate of potash, half an ounce. A teaspoonful to be taken twice a day. Or the following dropsy powder:—Powder of digitalis, 1 grain; powder of squills, 1 grain; extract of conium, 2 grains; to be taken twice a day.

BERI BERI

is a very fatal disease common in many parts of India, and begins by bloodlessness, and stiffness, numbness, or even paralysis of the lower limbs. There is weakness, palpitation, and breathlessness on exertion, cold extremities, costive bowels, and general dropsy. A residence of several months in a district where it prevails is necessary to its development.

Treatment.—Stimulants, good diet; tonics—quinine 2 grains daily; turpentine, 4 drops may be needed twice daily.

PART II.

LOCAL DISEASES.

(Before reading the diseases of any system read the plan of the book given in the Table of Contents.)

LOCAL diseases comprehend all those which affect the structures of special organs or particular parts of the body ; they are often accompanied by constitutional symptoms which are secondary to them ; thus, inflammation of the lungs is accompanied by fever, which often bears a close resemblance to typhoid fever ; on the other hand, general diseases have sometimes very striking local effects, as ulceration of the bowels in typhoid fever. The nature of the disease is ascertained by finding which began first, the constitutional or local affection.

CHAPTER I.

DISEASES OF THE NERVOUS SYSTEM.

THE nervous system consists of two parts : 1st, the brain and spinal cord with the nerves proceeding from and to them, which includes all the nervous organs in and through which the mind acts directly ; and secondly, the sympathetic system of nerves and nerve-centres which supply nervous energy for the continuous involuntary movements in health, such as the movements of the heart, stomach, bowels, and secreting glands of the body, as well

as preserving the tone of the blood-vessels. The mind has an indirect influence on the organs supplied by the sympathetic system; thus we cannot blush or shed tears at will, but suitable mental feelings cause these conditions.

The brain alone furnishes the conditions necessary for intelligence, the spinal cord the conditions necessary for combined movements, excepting the muscles of the face, tongue, and jaw, and together they connect the balance and regulation of motor and sensory power. The nerves consist of a number of fibres bound up in a sheath, and are of five different kinds: 1st, nerves of special sensation, comprising smell, sight, hearing, and taste; 2nd, nerves of common sensation, and 3rd, nerves of motion; 4th, mixed nerves of motion and sensation; 5th, the sympathetic system of nerves. All nerves are endowed with the vital property of sensibility, in virtue of which they can be excited by chemical, mechanical, or electrical stimulants, or by heat, to convey the influence of the impressions they receive from or to the brain, spinal cord, or nervous centres. Nerve-fibres possess no power of originating impulses; they require to be stimulated, and each *fibre* conveys the impression made on it separately without imparting or diffusing it, acting merely as a conductor. Nerve-fibres convey only one kind of impression, those of sensation towards the brain or nerve-centres, or those of motion from the brain or nerve-centres, while mixed nerves consist of both classes of fibres and convey in both directions.

Whatever be the stimulus applied, whether mechanical, chemical, electrical, or heat, the kind of sensation transmitted remains the same; hence irritation of the optic nerve, as by a violent blow, causes flashes of light, of the auditory nerves causes singing in the ears, and so with the rest.

When an impression is made on the trunk of a sensitive nerve the mind may perceive it, not only at the place where it is made, but also at all the points where the irritated fibres are distributed. Thus, if the ulnar nerve be compressed at the elbow (often called the funny-bone), the sensation of pins and needles is felt in the palm and back of the hand, and in the fifth and half the fourth finger. In like manner, after amputation of a leg the patient may complain of pain in the toes, or cramp in the calf, from irritation of the fibres which formerly supplied these parts. From this reason patients who have had an amputation under chloroform not unfrequently refuse to believe the limb is off till they see the stump.

The habit of the mind to refer impressions to the part which the nerve used to supply, is seen in making an artificial nose from the skin of the forehead: so long as the connecting bridge of skin to the forehead remains uncut, a touch on the nose feels as if it were made on the forehead.

The speed of the nerve current in the frog has been found to be about thirty yards a second, or at the rate of an express train. In man the mind requires about $\frac{1}{10}$ th of a second to exercise sensation and volition when the signal is by touch; about $\frac{1}{3}$ th of a second when the signal is by sight, and about $\frac{1}{7}$ th of a second when by hearing. Sensation may be defined as the consciousness of an impression, and that it may take place it is necessary (1) that a stimulus be applied to a nerve of sensation; (2) that in consequence of this an influence should be generated and conducted along the nerve to the brain; (3) consciousness of the influence. Sensation may be lost by anything which destroys or hinders the sensibility of the nerve, as cold to the skin in frost-bite; or its conducting power, as compression or cutting of the nerve

or spinal cord, by which communication with the brain is cut off; and, finally, by the mind being excited, inattentive, or suspended—a common example being the use of chloroform, producing unconsciousness. Motion is accomplished through the muscles, which are endowed with the vital property of contractility, as nerves are with sensibility. Contractility may be excited independently of the nerves by various stimulants, but may also be excited by physical or mental stimuli operating through the nerves. Integrity of the muscle alone is needed for contractile movements, but there must also be integrity of the spinal cord for reflex movements, and also of the brain for voluntary movements. In healthy people the nerves of motion receive a part of their stimulus or excitement (1) from the will producing voluntary motion; (2) from parts of the brain which, when excited, are independent of the will, such as the movements in anger, grief, or pain; and (3) actions produced without the will, or even against it, and which are independent of consciousness, in many cases going on after an animal is decapitated. They are produced by impressions conveyed by a sensory nerve to a nerve-centre, from which it is returned, or *reflected*, as a motor influence along a motor nerve, causing movements which are hence called *reflex* movements.

For reflex action three things are necessary: (1) one or more sensory nerve-fibres to convey an impression to the nerve-centre; (2) a nervous centre to reflect the impression by a motor nerve. The spinal cord is the nerve-centre for all muscles of any size in the body; (3) one or more motor nerve-fibres to conduct the impression to the contracting tissue.

All reflex actions are essentially involuntary, though they may be modified, controlled, or prevented by a voluntary effort. In health all reflex

ctions have a distinct purpose, to secure the well-being of the body, but in disease they may be irregular and purposeless. Examples of the first are seen in breathing, the action of the bowels, and swallowing, while the purposeless movements of disease are seen in epilepsy, chorea, and tetanus. When reflex movements regularly recur by a moderate stimulus, they are called automatic, as in swallowing, where the contact of the food with the sensory nerves of the throat is the stimulus, or in breathing, where the stimulus is the carbonic acid in the blood, or sucking in infants, where the stimulus is touching the skin of the lips. Many complex actions acquired at one time afterwards become automatic, such as walking, singing, playing on musical instruments, and the like. Reflex actions, which are also more or less voluntary, are coughing, yawning, sneezing, sobbing, laughing, crying, and hiccough. Actions which occur quite independently of consciousness are the movements of the bowels, heart, movements of the feet on tickling the soles, winking, winking on approach of a body to the eye, closure of the windpipe when swallowing, and the like. Reflex movements are sometimes increased by destroying the connection of the organ with the brain; thus, on dividing the pneumo-gastric nerve, the heart beats quicker, from the sympathetic ganglia or nerve-centres of the heart being no longer restrained by the action of the brain, and in paralysis of the legs from a broken back the patient sees his legs kick when the soles of the feet are tickled, but he feels nothing, and cannot restrain the kicking.

All the functions of the nervous system may be increased, perverted, or destroyed, according to the degree of stimulus or disease acting on the various parts; a slight stimulus usually increases the action, a stronger stimulus, or longer continuance of the

same, perverts nervous action, while a still stronger stimulus destroys it. The seat of the disease, and the rapidity or slowness of its occurrence, influence the symptoms; thus, disease of one side of the brain paralyzes the other side of the body, and as a rule a small injury, as blood poured out, occurring suddenly, and with force, produces more violent effects than an extensive disease which comes on slowly. Whatever the nature of the injury, if the same part of the brain be affected, the symptoms are much the same.

Excitement of a nerve of motion is shown by contraction of the muscle it supplies, in the same way that excitement of a nerve of sensation is shown by pain or reflex action. If a nerve of motion be excited a second time before the contraction of the muscle, from the first excitement, has died away, a permanent state of muscular contraction is produced, which is called tonic spasms. If the interval between two excitements is longer, so that the muscle has time to relax between the contractions, it is called clonic spasms, both of which are seen in tetanus and strychnine poisoning. The terms cramp and spasm are applied to certain morbid conditions, in which an irritant of unusual origin, independently of the will, causes excitement of the motor nerves, or where an ordinary stimulant causes violent excitement.

The sympathetic system consists of a number of ganglia, or nerve-centres, connected to each other, and to the nerves of the brain and spinal cord, by a number of connecting filaments. They influence the general processes of involuntary motion, secretion, and nutrition, and the parts supplied by them are usually incapable of voluntary motion. The parts supplied with motor power from a sympathetic ganglion continue to move, though cut off from connection with the rest of the nervous system:

for example, the heart of some reptiles continues to beat for hours after being removed from the body. Movements caused by irritating a motor nerve which does not pass through a ganglion are convulsive and disorderly, while if it passes through a ganglion the movements are orderly, and like natural movements. In health the mind is not conscious of the movements caused by the sympathetic system, but in disease it may communicate the sensation of severe pain to the spinal nerve, and thence to the brain, as in angina pectoris and colic. When the sympathetic system is irritated, as in the first stage of fevers, it causes contraction of the blood-vessels, hence the chilliness and cold pale surface; but as the fever becomes more intense the sympathetic system becomes paralysed, allowing the blood-vessels to extend to their full size, causing heat. The same result also takes place in inflammation.

In disease all exaggeration or perversion of sensation, motion, body heat, special senses, especially that of the eye, and mental faculties require to be noticed, as all give more or less valuable warnings of disease, and means of judging as to its course. *A general rule of treatment, applicable to all diseases of the nervous system, is to keep the head cool, the feet warm, and the bowels open.*

(a) The brain is the seat of the injury or disease when intelligence or several special senses are affected together; when the muscles of the face and tongue are involved, and the eyelids can still be closed; or when there is paralysis of one side of the body only—*e.g.*, insanity, apoplexy, somnambulism.

(b) The spinal cord is the seat of the disease or injury when both sides of the body are affected and the mental powers remain unchanged—*e.g.*, lock-jaw, chorea, hydrophobia.

Both the brain and spinal cord are affected in epilepsy and catalepsy.

(c) The nerve trunks are the seat of the affection when the symptoms are referable to a single group of muscles or a small portion of skin, *e.g.*, neuralgia and local paralysis.

Contrast between Vomiting from Affection of the Brain and from Irritation of the Stomach.

Brain or Nervous System.	Stomach or Liver.
1. Little or no nausea, retching continues though the stomach is empty, and anything taken is rejected at once.	1. There is nausea, relieved at least for a time by the discharge.
2. Vomit consists of unaltered food and frothy mucus; never pus or blood.	2. Vomit consists of half-digested food, offensive secretions, bile, and sometimes acid water, pus or blood.
3. Appetite remains; there may be a desire for food directly after vomiting.	3. Loss of appetite or even disgust for food.
4. The tongue may be clean, the breath pure. The membranes (white) of the eye are colourless, and headache is primary in point of time.	4. The tongue is coated, the breath is foul, the membranes (white) of the eye may be yellowish, and the headache is secondary in point of time.
5. Obstinate constipation or solid healthy stools, no eructations of foul air.	5. Gripping pains in the belly, foetid eructations, diarrhoea, unhealthy watery stools.
6. Stomach emptied without effort, no increase of saliva, tenderness of belly or faintness after vomiting.	6. Retching, increased saliva, tenderness of belly, faintness or exhaustion.

GROUP I.

DISEASES OF THE BRAIN AND ITS MEMBRANES.

The general treatment of diseases and injuries of the brain is directed to keeping down the blood pressure in the head, which is done by cold to the head, purgatives, which act by drawing blood to the bowels, warmth to the feet, and mustard poultices to the calves of the legs or belly, which draw the blood to them.

Distinguishing Characters of Diseases of the Brain from Diseases of its Membranes.

Brain.	Membranes.
1. From the outset, or from a very early stage, there is loss of one or more of the nervous functions, such as paralysis, loss of sensation or of memory.	1. It is not till some time after the disease has shown itself that diminution or loss of nervous function takes place.
2. Is not usually attended with very marked exaggeration of function, such as furious delirium, intense sensibility, pain or tenderness.	2. There is generally severe excitement or exaggeration of nervous function, such as pain, tenderness, furious delirium or convulsions, followed by diminution or loss of function.
3. Little excitement of the circulation in the head and scalp, or general disturbance.	3. Much excitement of the circulation in the head and scalp, with general disturbance.
4. Paralysis and loss of sensation, will, perception, and the like.	4. Spasms, convulsions, pain, and delirium.

Inflammation of the Brain and Membranes (Encephalitis) is a rare disease and may arise from morbid poisons, as of fevers; from injuries, intemperance, death of some bone of the skull, or natural decay. It occurs at all ages. There is some heat of the head and surface. The face is pale, the pulse slow and irregular, and the breathing variable and sighing. There is acute headache, which does not abate when the fever subsides, as it does in twelve to twenty-four hours, along with constipation, sickness and vomiting. The patient has a look of oppression or sullenness, suffused eyes, confusion of thought or even delirium, and contracted pupil. After twelve hours to two days the second stage sets in, with difficult or indistinct articulation, dull vision and hearing, twitchings of the muscles, pupil contracted to the size of a pin's point, convulsive paroxysms, paralysis and profound sleep (coma), which usually ends in death.

Treatment.—Cooling lotions to the^h head, such as vinegar 4 table-spoonsful, chloride of ammonium 1 teaspoonful; 20 grains of compound jalap powder; milk diet, and rest with the head elevated above the shoulders.

Inflammation of the Brain Membranes (Meningitis) may arise from one of the specific fevers or rheumatism, gout, syphilis, inflammation of the lungs, Bright's disease, protracted diarrhoea, or without apparent cause. Premonitory symptoms may be trifling or absent; the most common are slight but increasing pain of the head, irritable temper, restlessness, shivering and pale skin; or in children, convulsions followed by fever, irregular sighing breathing, often with moaning. If the pulse falls from 140 or 120 to 80 or 60, while the fever and other symptoms increase, it is almost certainly meningitis. The skin gets hot and dry,

the pulse is hard and rapid, the bowels are obstinately confined, and the stools are dark and offensive. In this stage there is little or no prostration of strength, the headache becomes acute with intense pain, the eyeballs stare and are injected, the face flushes and turns pale alternately. The temper is very irritable, and there is marked drowsiness or wakefulness, sometimes alternately, for several days. Noisy, violent delirium sets in early, the patient screaming and gesticulating in the wildest manner; the expression of countenance is savage, fierce, or malignant. The sharp, darting pain of the headache elicits a piercing cry, especially in children, who carry the head in their hands. The pain is increased by the impressions of the senses; hence the eyes are kept obstinately closed, and the ears if possible covered with the bedclothes. Restlessness is incessant, with muscular twitchings and squinting, or rolling of the eyeballs. Vomiting is frequent without pain, tenderness, or sickness. This stage lasts from one to four days.

In the second stage the fever lessens, the pulse is slower, weaker, and varies very much in a short space of time; breathing is very irregular, the tongue is brown and dry, the bowels continue confined, the heat of the head continues, but the body is cool and excitement diminishes. The delirium is apt to pass into coma (deadly sleep), and there is great prostration. When the disease ends favourably, improvement is very gradual.

In meningitis of the aged there are few symptoms beyond peevish or irritable temper and confusion of intellect, with restlessness and unsteady gait.

Treatment is according to the cause. Generally 20 grains compound jalap powder to get motion of the bowels, repeated if necessary. The head should be raised and cooling lotions applied to the (shaved) scalp, or bladders of crushed ice; leeches

applied behind the ears, milk diet, rest in a quiet darkened room; and when the active symptoms are subdued, a blister to the back of the neck.

Water Brain Fever.—Acute Hydrocephalus: Tubercular Meningitis occurs chiefly in children between the ages of two and four. It is rarely found during the first year of life or after the twelfth. When it occurs in adults it is almost always along with consumption of the lungs.

Serofulous children with large heads and precocious intellects, and especially the children of parents addicted to drunkenness, are the most frequent victims. The symptoms may be divided into three stages.

1st stage. The child shows a change of manner and has no desire to play, but sits in a corner resting the head on the hands. It complains of pain in the head, and is drowsy yet restless. There is loss of flesh and feverishness with confined bowels, sunken belly, and vomiting, especially when disturbed or made to stand.

2nd stage. After some days, or even weeks, more prominent symptoms appear. The child complains more of the head, turns from the light and starts at every sound, it gnashes its teeth during sleep and occasionally gives a piercing cry; it often starts with terror at some dream and continues terrified for some time after waking. The head is hot and bent back, boring into the pillows, the lymphatic glands of the neck swollen, the muscles of the back of the neck contracted, and there are twitchings of the limbs. At this stage the pupils of the eyes are contracted, and the pulse rapid. After four or five days there is a change of symptoms.

3rd stage, often marked by general convulsions. The vomiting abates or ceases, the face is alternately flushed and pale, the eyes closed, and the eyebrows knit; the child no longer complains of

pain, but puts its hands to its head in a peculiar way. It wishes to be left quiet, but does not turn away from a light nor start at a noise as it did formerly. The peculiar cry and gnashing of the teeth continue, the pupil becomes dilated, and the eyes squint and no longer regard objects held in front of them. The pulse becomes slower, falling to 60 or less, and the breathing is peculiar, several slight breaths being succeeded by a deep sighing inspiration. Stupor (coma) comes on and gradually increases, the lucid intervals grow shorter and less complete, the eyes stare into space, or the upper eyelid droops and the eyeball is rolled up so that the pupil is half covered by the eyelid, the cheeks often become bright, and the eyes when visible are dark and brilliant from the dilated pupil, or the face may be dark-coloured and pinched with the eyes sunken. The child lies insensible, picking its nose and lips with trembling fingers, and may have fits of convulsions or paralysis. There are often deceitful remissions which last for a short time. After about a week in fatal cases, twelve to twenty-four hours before death, the pulse gets quick and feeble, the skin is covered with cold perspiration, the belly becomes puffed up, and the stools and urine are passed involuntarily.

Treatment.—At the outset, when the headache is severe and the child full-blooded, leeches behind the ears. Ice or cold lotions to the shaved scalp. Regular action of the bowels by calomel, 2 grains for a child of five years old, and iodide of potassium 3 grains twice a day, with milk diet. It is of great importance to recognise the disease early, and begin proper treatment at once. Though a very fatal and treacherous disease, life is not *always* to be despaired of, even when well advanced. I have had recovery of a child (whose four brothers and sisters had died of acute hydrocephalus) after

being insensible more or less for three weeks, by persistent use of cold to the head, iodide of potassium, free action of the bowels, and milk diet. In event of recovery, when there is an hereditary tendency, as in children whose brothers or sisters died of acute hydrocephalus, cod-liver oil should be given for a considerable time, say a month, two or three times every year till twelve years old.

Spurious Hydrocephalus.—Children from a few months to three years old, who have had diarrhoea or been severely purged by medicine, or who have ceased to thrive after being weaned, having green stools, are apt to have a false appearance of hydrocephalus. The child lies on its nurse's lap unable or unwilling to raise its head. It seems half asleep, one moment opening its eyes, and the next closing them again with a remarkable expression of languor; the eyes are not attracted by any object in front of them, and the pupil remains unmoved on the approach of light. The breathing is irregular, sometimes sighing, and the voice is husky. The tongue is slightly white, and the skin is not hot, but sometimes colder than natural. This disease has been sometimes mistaken for hydrocephalus and the child leeches out of its life. To distinguish them, notice if the unclosed portion at the top of the skull (fontanelle) is convex and prominent; if it is, the disease is probably hydrocephalus, and you may expect benefit from leeches, but if it is concave and sunken it proceeds from emptiness and want of support, and the child requires nourishment, brandy in arrow-root, milk, from the mother's breast if possible, or cream and an equal amount of water.

Acute and Spurious Hydrocephalus.

Spurious Hydrocephalus.	Acute Hydrocephalus.
1. Fontanelle concave and sunken. 2. Head cool and face pale. 3. Bowels purged.	1. Fontanelle convex and prominent. 2. Head hot, cheeks may be flushed. 3. Bowels are obstinately confined.

Difference between Acute Hydrocephalus and Infantile Remittent Fever.

Acute Hydrocephalus.	Infantile Remittent Fever.
1. Most common between three and five. 2. Tongue moist and white. 3. Repeated vomiting. [fensive. 4. Stools black and of- 5. No thirst. 6. Skin of the body cool. 7. Irregular remissions.	1. Most common between five and nine. 2. Tongue dry and brown, with red tip and edges. 3. Vomiting when present soon ceases; bowels relaxed. 4. Stools thin, yellowish. 5. Great thirst. 6. Skin very hot. 7. Remissions in the morning; worse at night.

Inflammation of the Brain.—Inflammation of the brain substance alone is a rare occurrence, and is limited to one part of the brain. It may arise from long suppuration from the ears, specific fevers or external injuries. The symptoms show cerebral irritation more prominent one time in the

sensory, another time in the motor or mental functions.

In the Sensory.—Violent headache, intolerance of light, and increased sensitiveness of all the special senses. *The motor symptoms* consist of restlessness, sudden starting, vomiting, gnashing the teeth, crying out, twitching of single muscles, and convulsions. *The mental symptoms* are confusion of ideas with loss of memory and delirium, in which there are hallucinations and illusions. Instead of irritation there may be cerebral depression, in which sight and hearing are impaired, and all the senses are less active.

Treatment.—Same as ENCEPHALITIS, which see, p. 138.

Softening of the Brain is usually partial, the size of a walnut to a hen's egg; chronic, and due to obstructed circulation. When small it may heal, leaving a cyst filled with serous fluid. The symptoms are usually acute, but for a considerable time there are none.

There are three different kinds of softening:

1. White, which is death of a portion of brain substance from impaired nutrition, generally due to disease of the large arterics (atheroma).
2. Red and inflammatory softening, which is due to the closure of some artery by a clot of blood or film, or may be the last stage of acute hydrocephalus.
3. Yellow softening, which is a fatty degeneration of a portion of brain substance, due to the obstruction of an artery at the base of the brain. It has no tendency to cure, and is generally fatal in a few days. The attack is like apoplexy, and is often without premonitory symptoms.

Abscess of the Brain is generally caused by inflammation of the internal ear after scarlet fever, measles, small-pox or scrofula. The symptoms are obscure; those which attract attention are usually

sudden headache, fever, and vomiting. The patient is sullen and may be delirious, with contracted pupils, and shuns the light. It is not always recognised during life even by experienced physicians.

Treatment.—Rest and quiet, regular action of the bowels, milk diet, and iodide of potassium 2 grains twice a day. The duration of abscess varies from three weeks to three months.

The premonitory symptoms are pain in the head, more or less severe, sudden and short attacks of giddiness, diminished mental power, depression of spirits, prickings and twitchings, a pain and numbness in the limbs, drowsiness, especially after meals, impairment of sight and hearing. In red softening, headache, cramps, and transient excitement, or mild delirium, precede the loss of perception. The patient lies still as if in a profound sleep, but immediately gives the hand or puts out the tongue if told to do so, intelligence remaining intact. The loss of perception and volition, however, is not recovered from.

Paralysis of a limb or one half of the body may come on suddenly without loss of consciousness. The patient is easily confused, and has a difficulty in answering questions and in making himself understood. The muscles of the face are more or less paralysed on one side, speech is impaired, and after slight recovery continues so. The pulse is weak and intermitting, vomiting and constipation occur in some, involuntary escape of stools, difficult breathing becoming snoring, and stupor precede death. The symptoms vary considerably; the following may occur in different cases: 1. Imperfect stupor, partial loss of consciousness with rigidity of the limbs; 2. Perfect stupor without rigidity; 3. Paralysis without loss of consciousness; 4. Paralysis with increased sensitiveness of skin; 5.

Rigidity coming on after return of consciousness. Softening and abscess are not so common as apoplexy or meningitis.

The after-effects differ from apoplexy. The symptoms do not suddenly disappear or improve gradually, but the mental enfeeblement and paralysis usually remain.

Treatment.—Rest, lying down with the head elevated; in severe seizures an injection of castor-oil and turpentine, a tablespoonful of each; if consciousness is not lost, 20 grains of compound jalap powder instead of the injection; hot bottles to the feet. If the head is hot, cold lotion to the head; if the eyes are suffused and the face red, leeches behind the ears may be required; milk diet, and after a time 2 tablespoonful of infusion of calumba twice a day. For pains in the patient's limbs, $\frac{1}{2}$ of a grain of morphia at bedtime.

Sunstroke is a disease allied to apoplexy, and is characterised by giddiness, faintness, thirst, sometimes headache, listlessness and torpor, with a desire to lie down, succeeded by more or less sudden and complete insensibility, the skin is hot and dry, the breathing rapid, the pupils contracted, the face pale, and an attack of vomiting or convulsions may usher in complete stupor. Just before death the pulse becomes fluttering, the breathing irregular and gasping, and the pupils dilated. Death may occur from five minutes to a few hours after the symptoms have set in. The patient is not free from danger till the skin gets cool and moist again. After recovery from the first symptoms, there is a great tendency to paralysis or various forms of insanity, so that he is not half the man that once he used to be. Generally the affection seems induced by fatigue or nervous exhaustion in a hot, dry atmosphere, and want of perspiration from not drinking enough. The attack is most common

during exposure to the rays of the sun, but in hot climates it may occur during the night.

Treatment.—Strip the patient naked and dash several buckets of cold water over him; in severe cases, if it can be had, rub the skin over with pieces of ice. The good effect of the treatment is shown by the pupils relaxing. Cut the hair short and apply cold lotions to the scalp, mustard poultices to the calves and over the belly for 10 to 15 minutes, and a blister to the nape of the neck. Ten grains of quinine, repeated in four hours if necessary.

Water on the Brain (Chronic Hydrocephalus) is an entirely different disease from acute hydrocephalus. It begins at birth or soon after in scrofulous or rickety children; the bones of the skull become enlarged, light, thin, and chalky, and the head may attain an enormous size, even up to two feet in diameter, and containing many pints of fluid; not unfrequently a part of the brain substance is broken down by the fluid into a white pulp, constituting white softening.

The disease usually shows itself in the first six months of life. The child takes food eagerly, but does not seem to thrive; the body becomes wasted, and the little old face, which does not agree with the large skull, forms a triangle with the head, the point being at the chin, and the forehead is prominent. The child is generally of feeble intellect, irritable temper, great muscular debility, and often liable to epileptic fits. It has great difficulty in holding up its head, and often there is rolling or squinting of the eyes. The symptoms may go on increasing to stupor, paralysis, and death; or after reaching a certain point, it may stop and remain permanent, or even improve to some extent.

Treatment.—Milk diet, cod-liver oil, iodide of potassium $\frac{1}{2}$ grain twice a day. If the symptoms

are advancing, free action of the bowels by calomel $\frac{1}{2}$ grain alternately with compound rhubarb powder. The head should be kept covered with flannel.

Hypertrophy of the Brain is most common in childhood and in dwarfs.

It consists of hypertrophy of the connective or packing tissue material and not the brain substance. The skull is enlarged, and the child may suffer from paralysis, convulsions, and other symptoms of irritation. Sometimes the child is sharp and clever, instead of being of deficient intellect as in hydrocephalus. The course of the disease is always chronic. There is no remedy which has any effect on the disease.

Atrophy of the Brain may be either, 1st, incomplete development; 2ndly, retrogression. There is usually weakness of intellect or decided idiocy, the senses are blunted, and there may be paralysis and wasting of one side of the body with epileptic attacks. The speech is impaired, and the gait uncertain and tottering.

Tumours in the Brain may be simple, cancerous, tubercular, glandular, fatty or cystic, aneurisms, or from syphilis. The symptoms vary according to the part affected; headache, vomiting, giddiness, and attacks of epilepsy are the most common. Syphilitic tumours are the only ones where treatment is of any use. Two grains of iodide of potassium three times a day. Both tumours and atrophy are rare.

Apoplexy is characterised by a state of stupor or profound insensibility, coming on suddenly, or at least rapidly. The patient seems in a deep sleep from which he cannot be roused. The pulse is slow and strong, or irregular, but laboured, *i.e.*, passes slowly under the finger; the breathing is slow and laboured, and accompanied by a snoring sound; the cheeks are puffed out with each expira-

ion like the flapping of a sail. There is frothy saliva about the mouth; fluids poured into the mouth are not swallowed, but cause choking or run out at the corners of the mouth; the limbs lie motionless, and if one is raised it falls again as if lead, and the pupils are contracted. In bad cases one or both pupils may be dilated, the teeth clenched, and some or all of the muscles rigid, with cold clammy sweat. After the seizure or fit has lasted from two hours to two or three days, the patient recovers consciousness, but one side of the body usually remains paralysed. On the affected side the angle of the mouth hangs down, the nostril is contracted, and the cheek puffs out at each expiration. On the sound side the angle of the mouth is pulled up and the nostril dilated; the face is pulled to the sound side, and when the tongue is put out it is pushed to the affected side (see FACIAL PARALYSIS, p. 163). The hand and foot cannot be moved except by lifting them by the hand of the sound side. These symptoms may gradually improve, but the patient never becomes so strong as before. The preceding are the symptoms of the most usual form of apoplexy, which is caused by rupture of a blood-vessel. There are three different kinds of apoplexy, the symptoms of which, during the fit, may be the same, but the after-effects differ.

1. *Hæmorrhagic.* When a diseased blood-vessel bursts and pours blood out into the brain—which explains why it is more common after forty, from the vessels beginning to degenerate—or where a clot chokes an artery of the brain; hence it is common in some kinds of heart disease.

2. *Congestive apoplexy.* Where the symptoms seem due to pressure on the brain from increased pressure of the blood in the vessels.

3. *Serous apoplexy.* Where the symptoms are

due to effusion of serous fluid (serum is the thin part of the blood), most common in Bright's disease.

The actual attack may come on in three ways.

1st. The most usual is to come on suddenly, the patient falling to the ground at once, devoid of sensation and consciousness. or he may merely stagger and have time to sit down. From this state, if he does not die during the fit, the patient may recover with paralysis of one side; or may recover completely after an interval of confusion where the symptoms are due to congestive or serous apoplexy.

2nd. The symptoms come on slowly, the patient complains of a sudden pain in the head, sickness, faintness, and sometimes vomiting. He may fall to the ground or have merely a slight transient loss of consciousness, but the pain in the head continues, and after a few hours he becomes heavy, oppressed, forgetful and drowsy, gradually passing into complete stupor, from which recovery is rare, the symptoms being due to rupture of a blood-vessel. and blood slowly pouring out.

3rd. There is an attack of paralysis of one side, but no loss of consciousness at first; the paralysis slowly passes into stupor, or he may slowly recover.

The blood poured into the brain may be absorbed, leaving a scar or a cyst filled with fluid; in either case the brain is weakened and predisposed to another attack.

The seizure usually occurs during some muscular exertion, such as pulling on a pair of boots, lifting a heavy weight, or even sudden change of position, as in stooping.

Apoplexy is more common in men than in women, and is rare before 40 years of age, though it is found even in children. It may occur quite unexpectedly, but usually there are premonitory warnings, extend-

ing over a variable period of a few minutes to months. The warnings are giddiness, particularly on stooping, headache, and a feeling of weight and fullness in the head, drowsiness, with heavy breathing, especially after meals, confusion of thought with occasional loss of memory, numbness in the limbs, disturbed sleep, mental depression, indistinct speech, temporary paralysis of some muscles: there may be bleedings from the nose, temporary blindness or deafness, or noises in the ears and flashes before the eyes.

Certain persons are predisposed to an attack. Those whose parents suffered from it, and people of sedentary habits who eat and drink too much, are frequent victims. Long-continued mental anxiety, violent emotions, intemperance, disease of the heart, kidneys, or blood-vessels of the brain, and sudden suppression of long-standing discharges, are all causes of apoplexy.

Treatment during the fit.—Loose the clothing about the neck, raise the head above the body. remove the patient into a cool, well-ventilated room, apply cold to the head by pounded ice, or, if that cannot be had, by cooling lotions of vinegar and water. If the power of swallowing is not lost, give 20 grains of compound jalap powder; if it is lost, place two drops of croton oil, well mixed in half a teaspoonful of olive oil or cream, on the back of the tongue. Apply mustard poultices to the calves of the legs and to the belly for ten minutes, and put hot bottles to the feet. In some cases, where there is a strong thrilling pulse, the blood-vessels of the head and face congested, the scalp hot and the skin warm, the breathing slow and snoring, blood-letting is required. The blood should be taken suddenly in a full stream from a vein in the arm, to about six ounces or more; but if the pulse be small, slow, feeble or irregular, the skin cold and

clammy, if the patient has been intemperate or suffered from disease of the heart, from gout or rheumatism, bleeding is not to be used.

The diet should be limited to milk, light puddings and fish, till all danger of a relapse is over. In event of recovery great care is needed to prevent a second fit. The patient must avoid strong bodily exertion, violent passions and emotions, heavy meals, strong wines, *hot* baths, long-continued stooping, tight neck-cloths, constipation and straining at stool, or any cause that favours the flow of blood to the head. He should take daily exercise in the open air and wash the head in cold water every morning. If there should be an attack of giddiness or bleeding from the nose, he should take a purgative such as 15 grains compound jalap powder.

Differences between the Stupor of Apoplexy and Concussion.

Apoplexy.	Concussion.
1. Patient cannot be roused.	1. Recovery to a slight extent soon after the injury.
2. Occasionally vomiting.	2. Vomiting in favourable cases.
3. Snoring and difficult breathing.	3. Breathing quiet.
4. Slow, strong, laboured pulse.	4. Fluttering or feeble pulse.
5. Face first flushed, then pale, cold, clammy sweats.	5. Face unchanged, skin cold and pale.
6. Pupils one or both dilated and insensible to light.	6. Pupils natural, but insensible to light.

Differences between the Stupor of Opium Poisoning and Intoxication.

Opium.	Intoxication.
1. Can at first be roused by loud noises.	1. Can be momentarily roused.
2. Occasionally vomiting.	2. Vomiting in early stage.
3. Breathing slow and snoring.	3. Snoring little or none.
4. Weak soft pulse.	4. Quick pulse.
5. Face livid, clammy sweats.	5. Face flushed, smell of drink.
6. Pupils much contracted and insensible to light.	6. Pupils dilated, sometimes contracted. When shaken, pupils dilate momentarily and contract again.

GROUP II.

DISEASES OF THE SPINAL CORD AND ITS MEMBRANES.

Spinal Meningitis (Inflammation of the Membranes of the Cord).—Is not a common disease. It probably never occurs of itself, but from injury, disase of the bones (caries), exposure to wet and cold in rheumatic people. syphilis, gout, or extension from the brain.

There is high fever and sleeplessness, acute burning pain in the back, extending into the limbs, which becomes unbearable on motion of the back or pressure over the spine. There is rigidity, or tetanic contraction of the muscles of the neck and back. occasionally interrupted by convulsive starts. There is feebleness of the limbs, and stiffness of the

muscles, worse in the morning, after a night's rest, and which may go on to paralysis, and gradually extend upwards. There may be retention of urine, constipation, and a feeling of constriction in the neck, back, and belly, along with a feeling of suffocation.

Treatment.—If it arises from injury, cold lotions to the spine; if not from injury, warm baths, leeches along the spine; moderate purging by $\frac{1}{4}$ to $\frac{1}{2}$ an ounce of sulphate of magnesia, along with 40 drops of tincture of hyoscyamus. If there is severe pain along the spine, warm fomentations, containing 2 teaspoonsful of tincture of hyoscyamus to a cupful of water, may be used. When the acute symptoms subside, blisters on each side of the spine, and iodide of potassium 3 grains twice a day.

Inflammation of the Spinal Cord (Myelitis).—Is of rare occurrence and may be excited by cold, damp, injuries, or extension from disease of the bones. It may terminate fatally, by inflammation, softening, or abscess. The symptoms vary according to the part affected. The first thing noticed is a feeling of cold and numbness in the fingers and toes, and extending up the limb, followed by pain in the back, which is not constant, but is increased by pressure over the affected part, or by application of a sponge filled with hot or cold water. These symptoms are succeeded by impaired motion, and often diminished sensation in one or more limbs, followed by palsy of both sides of the body. If only one side of the spinal cord is inflamed, only one side of the body is paralysed. The paralysis is more extensive the higher up the seat of inflammation. (See SPINAL HÆMORRHAGE.) Bed-sores are apt to form in chronic cases.

Treatment.—Twenty grains compound jalap powder. Keep the bowels open three or four times a day. After the pain in the back is subdued,

and paralysis appears, $\frac{1}{4}$ th of a grain of strychnine three times a day, till starting of the limbs during sleep is produced.

Spinal Hæmorrhage (Spinal Apoplexy).
--Is less frequent than apoplexy of the head, is usually the result of injuries, but may arise from inflammation of the cord or its membranes, from fatty degeneration of the blood-vessels, or from disease of the bones (vertebræ). If the clot is large and high up, death may occur at once. The symptoms vary, and depend on the part of the cord affected. If the spinal cord is completely compressed above the third bone of the spinal column, instant death is the result from suspension of breathing. If lower down the general symptoms are loss of sensation and motion in all parts having nervous supply from below the injury. After a time diminished temperature in the paralysed parts, feeble circulation, and congestion of the lowest lying parts, a cadaverous hue of skin, and unhealthy bloodless appearance of the patient.

When the clot or compression is at the lower end of the spinal column (lower lumbar) there is paralysis of sensation and motion of the lower limbs, and unconscious passage of stools and urine; or there may be retention of urine till the bladder is filled, and then a constant dribbling, owing to paralysis of the bladder and the sphincter muscle of the bowel. The patient feels as if a cord was tied tightly round his body.

When the compression is below the middle of the back (lower dorsal), there is in addition paralysis of the muscles of the belly, and distension of its walls, causing expiration to be less perfectly performed. When the compression is as high as nearly the level of the shoulders (third dorsal), sensation all over the trunk of the body is lost, except in front as far down as the level of the nipples, breathing is pecu-

liar from paralysis of the muscles of the ribs, and is almost entirely carried on by the diaphragm, or midriff, expiration especially is laborious, the patient can yawn, but cannot cough or sneeze. Defective oxygenation of the blood gives rise to breathlessness, and may cause congestive pneumonia.

When the compression is as high as the fifth bone of the neck, in addition to all the other symptoms, the arms are paralysed, and the patient presents the extraordinary appearance of a living head with all its powers unimpaired, attached to a trunk and limbs of whose existence he is conscious only by sight.

Treatment is the same as for inflammation of the spinal cord. Disease of the bones may give many of the same symptoms, and may be relieved or cured by surgery. Rest and keeping the diseased bones apart by a case of bandage stiffened by plaster of Paris.

Spina Bifida is a disease in which a portion of the spinal canal is not closed at birth. There is a soft swelling, covered with skin, or a membrane, like that which lines an egg, in the lower part of the child's back (lumbar region). At its base the edges of the bone may be felt, and the swelling is increased by crying or straining. The swelling usually increases rapidly, and the skin reddens and becomes thin, and finally perforates, generally followed by convulsions, stupor, and death.

It is not necessarily fatal, but most children having spina bifida die before puberty.

Treatment.—Protect the swelling by a piece of leather. Sometimes a cure can be effected by surgical interference.

GROUP III.

DISEASES OF THE NERVES.

Paralysis (Palsy) is usually restricted to loss of voluntary motion, and may be local, restricted to a part or muscle, or general when all the limbs are affected. Paralysis of the nerves of sensation is called anæsthesia. Paralysis may be due (1) to some affection of the brain; (2) to pressure upon or injury to a nerve; (3) to hysteria; (4) to the influence of poisons, such as lead. The palsied muscles may be (1) little different from health, but less firm and less excitable by electricity; (2) completely relaxed, soft, and rapidly wasting, and scarcely excited at all by galvanism; (3) contracted and rigid, the flexing muscles being always more rigid than the extending, and generally associated with wasting; (4) the muscles do not waste, but are constantly firm and rigid, the paralysis is not complete, and the excitability by electricity is increased.

When the muscles are rigid, blistering and blood-letting are of service; in complete relaxation they are useless or hurtful.

Paraplegia.—Paralysis affecting the lower half of the body on both sides. It may be due to disease of the spinal cord and its membranes, or due to reflex action from a sensitive nerve, such as from the irritation of teething, or worms in children. from wounds, from affections of the womb, from urinary affections, or emotional paralysis.

The symptoms usually begin slowly with weakness, numbness and tingling of the feet and legs, the weakness increases till there is loss of sensation and motion in the legs, paralysis of the bladder and sphincter muscle of the bowel, with involuntary movements and spasms of the legs.

Treatment.—In reflex paraplegia endeavour to remove the cause. $\frac{1}{30}$ th of a grain of strychnine and one grain of opium daily. When due to disease of the cord, a cold sponge causes a feeling of heat over the inflamed part, and a hot sponge a burning feeling. Apply a belladonna plaster over the spine, and iodide of potassium 3 grains daily. In both, nourishing diet and friction of the limbs.

Hemiplegia (Paralytic Stroke) is the most common form of paralysis, and affects only one side of the body, most commonly the left side. It indicates disease of the brain on the opposite side to that paralysed. If only one limb is paralysed, it is usually the arm. The paralysis may be complete, or some power of motion may be left. Consciousness may or may not be retained, but in either case the patient falls to the ground, because the balance of the body is destroyed. The affected arm and leg fall to the side as if lifeless, the leg resting on its outer side with the toes turned out. Tiekling the sole of the paralysed foot causes involuntary kicking or starting, but what is called reflex action, depending on the spinal cord.

The eye remains permanently open, the face is drawn to the sound side, and hangs down on the paralysed side, food accumulates in the cheek, there is loss of power of chewing on that side, the tongue is pushed out to the paralysed side, speech is imperfect, and taste is lost in the front two-thirds of the tongue, which results from implication of the seventh, fifth, and ninth cranial nerves. If the third nerve is also involved there is drooping of the upper eyelid, dilated pupil, which is insensible to light, and rolling outwards of the eyeball, and the eye constantly accommodated for long distances, causing indistinct vision. Where swallowing is impaired there is serious and extensive injury to the brain.

When paralysis is not so severe as to prevent

walking, the attitude and gait are characteristic. The patient leans to the sound side, and the affected limb is swung outwards like a pendulum, with the toes pointing downwards as the foot leaves the ground, while the affected arm is carried by the opposite hand.

Treatment.—Rest, lying down with the head raised, the mind kept tranquil, and free action of the bowels, secured by 20 grains compound jalap powder : afterwards exercise of the paralysed limbs by moving them, and rubbing with the hand or a flesh brush. After a time small doses of strychnia $\frac{1}{40}$ th of a grain twice a day.

Locomotor Ataxy is a peculiar form of apparent paralysis, most common in men between thirty-five and fifty, and which is caused by exposure to cold when fatigued, by sexual excesses, or by rheumatism or gout. The course of the disease is always tedious, extending over years, and perfect recovery is rare.

The patient may have tearing pain in the lower limbs, which is generally considered rheumatic, for months, or even years, before the other symptoms appear. Persons who are accustomed to walking notice that they are sooner and more easily fatigued than formerly : these symptoms are succeeded after a time by a feeling of furriness, numbness, and a sensation as if a cord were tied round the middle, which may be accompanied or preceded by imperfect or double vision, squinting, contracted or dilated pupil, and deafness. These affections generally appear at different times and singly, and after remaining some time may disappear. A distressing symptom in many cases is incontinence of urine ; the patient cannot defer the call to urinate for more than a few seconds. There is occasional constipation, when the pains are severe, and it always aggravates them. Tickling sensa-

tions prevail in different parts of the body, and a feeling of numbness and of pins and needles in the legs, as if "asleep." After some time the gait becomes awkward and uncertain, the pains occur irregularly, and dart from limb to limb. There is diminished sensibility in the affected limbs, the floor is no longer distinctly felt, the foot seems to rest on wool, soft sand, or a bladder filled with water. The muscular force is not diminished, but the power of regulating the movements gradually diminishes. If the patient does not also see his movements, the power of regulating them will be still more uncertain, so that he prefers remaining at home in the evening. The feet are lifted too high, and thrown forward and outward in quick, short, jerking steps, and strike the ground with the heel first, with a forcible stamp. If the patient stands with the heels together and closes his eyes, he begins to totter, and unless supported falls to the ground. As the disease progresses the limbs are thrown involuntarily to the right or left without power of control, and after a time walking becomes impossible even with the aid of a stick, although the muscular force remains good. Reflex actions do not take place on tickling the feet, and involuntary jerking of the limbs take place during sleep. The same symptoms come on at a later period in the upper limbs, the fingers become numb, and cannot button the clothes, when eating or drinking the contents of the spoon or glass are spilt, and combined movements, such as writing, become impossible. There is no tenderness over the spine, and memory and intellect are unaffected.

Treatment.—Blisters over the spine. Thirty drops of dilute phosphoric acid in water daily. One tablespoonful of cod-liver oil daily; nutritious food and flannel worn next the skin. When the pain is severe, half a grain of extract of belladonna.

Wasting Palsy (Progressive Muscular Atrophy) is not common and is a fatty degeneration of the muscles, which is often hereditary, and attacks all ages, but men more frequently than women.

The onset of the disease is slow, and it creeps on unawares, usually beginning in the ball of the thumb or in the muscles of the shoulders. The patient notices a loss of power and awkwardness in the affected limb, the weakness goes on increasing till the lifting power is lost and the grasp is gone. Muscular twitchings or quiverings of the fibres of the affected muscles occur unconsciously to the patient. The bulk of the affected parts may be increased, sometimes enormously so. A child may have the lower limbs as large as a man's from deposition of fat among the muscles, and yet be unable to walk, the apparent increase of muscle being really a diminution, and the wasting increased by the pressure of the fat. The skin over the affected muscles retains its sensibility, there is unusual sensitiveness to cold, and the temperature of the affected parts is lowered. Occasionally there are neuralgic pains, most marked at the onset of the disease. The general health seems moderately good, and the intellectual powers are unimpaired. Complete recovery is rare, but the progress of the disease is sometimes arrested.

Treatment.—3 grains of carbonate of iron twice a day after food. Cod-liver oil, two teaspoonsful daily an hour after dinner. A weak current of electricity for five minutes at a time thrice a week. Frictions of the wasted limbs, and occasional warm baths.

Differences between Wasting Palsy and Locomotor Ataxy.

Locomotor Ataxy.	Wasting Palsy.
1. Rare in childhood and old age.	1. All ages.
2. Much more frequent in men.	2. More frequent in men.
3. Power of the affected limbs remains, but cannot be regulated.	3. Power of affected parts lost.
4. Loss of sensation in the skin of the affected parts.	4. Sensation remains.
5. Reflex movements lost.	5. Reflex movements remain till the muscle perishes.

Infantile Paralysis is a form of palsy of obscure origin, which occurs among children during teething—that is, from the sixth month till the third year. It occurs suddenly, and never extends from the limb first attacked to others. There may be slight fever and convulsions; and when consciousness returns, a foot, a hand, a leg, or an arm, or both legs, may be paralysed; but never a leg and arm on the same side; the bladder and bowels also are never paralysed. Sometimes the disease ends in a day or two in complete recovery, but in most cases it is stationary and permanent. After a time the affected limb becomes soft, relaxed, and flexible, and gradually withers. The skin becomes thin, the fat is absorbed, the muscles waste, and even the bone is diminished. In the course of a year the affected limb is much smaller than its fellow, the skin is livid, and chilblains and ulcerations are easily formed on it. The general health may re-

main unimpaired, and the sufferers may attain a great age.

Treatment.—Persistent use of electricity at short intervals (the induced current); while the affected muscles retain their contractility, a cure may be hoped for. Rubbing the paralysed limb. Quinine $\frac{1}{3}$ rd of a grain, and iodide of potassium $\frac{1}{2}$ grain daily.

Local Paralysis is paralysis limited to particular sets of muscles, of which there are many varieties.

Facial Paralysis may be due to disease or injury of the facial nerve; but most frequently it occurs from exposure to cold or irritation from decayed teeth. The attack is usually sudden and unattended with pain, and is discovered by the patient when he begins to eat, or he is told that his mouth is awry by the first friend who happens to meet him. When the face is at rest, the paralysed side looks slightly flatter and more flaccid, and hangs down, the palsied angle of the mouth is lower than the healthy one, the nostril is narrower, and the tip of the nose and mouth are drawn over to the sound side. When speaking, and still more when laughing, the angle of the mouth on the sound side is drawn upwards and outwards, but the paralysed side remains perfectly motionless, blank and unmeaning, giving a very peculiar appearance to the face. The cheek puffs out with each breath, and food accumulates in it, having to be dislodged with the fingers. Whistling, blowing, and spitting are impossible. There is a loss of taste in the front two-thirds of the tongue, and dryness of the mouth on the affected side. The palate and uvula are paralysed, hang down, and are drawn to the sound side. The forehead is smooth, and cannot be wrinkled as in frowning. The eye remains permanently open from paralysis of the eyelids,

but the eyeball is unaffected, the tears flow down over the cheek, and sensation of the cheek is unaffected at first. The affection is purely local, and is usually curable with facility. Contraction of the affected muscles is apt to follow the palsy.

Treatment.—Leeches behind the ear of the affected side, followed by blisters also behind the ear, and $\frac{1}{32}$ th grain of strychnia daily. Friction over the paralysed part and electricity thrice a week. If the muscles contract they must be stretched or pulled out.

Differences between Facial Paralysis and that of Disease of the Brain.

Facial.	Apoplexy.
1. The eyelids cannot be closed.	1. Eyelids can be closed.
2. The mouth cannot be pursed up, as in whistling, sucking, etc.	2. Mouth can be pursed up.
3. The eyebrows cannot be moved.	3. Can be moved.
4. Chewing is affected on both sides.	4. On one side only.
5. Tongue is put out straight.	5. Tongue is pushed to the paralysed side.
6. General health unaffected.	6. General health impaired.

Shaking Palsy (Paralysis Agitans) is characterised by an involuntary trembling or jerking movement of the muscles, with diminished muscular power. It begins in the hands and arms or head, and gradually extends over the body. It may be caused by prolonged exposure to cold, or by violent emotions, and is most common after forty

years of age. The senses and intellect are unaffected. The trembling is worse when the person is watched or pays much attention to it; in some cases it is so severe that not one spoonful of food out of three lifted is swallowed. The person stands stooping forwards, and when he begins walking there is a strong tendency to pass into a slow running pace, the walk resembling a man on springs; each time he puts down his foot the jerking step seems as if it would upset him to the opposite side.

It is a very intractable affection, and few remedies are of any use, attention to the general health, with occasional use of cod-liver oil and iron, being all that can be done. I know a man in whom it has remained stationary, becoming neither better nor worse, for upwards of ten years.

Writers' Cramp (Scriveners' Palsy) consists of morbid excitement of the motor nerves which supply the muscles of the thumb and fingers which hold the pen, resulting in a want of regulating power and cramp which renders writing impossible. It begins with a slight sense of fatigue of the hand, and a sense of insecurity, as if the writer must grasp the pen more firmly. Every attempt to write calls forth uncontrollable movements of the thumb and first two fingers, so that the pen starts up and down and forms grotesque interrupted scribbling. The more the patient tries to continue his writing, and the more attention he pays to it, or the more dread he has of the cramp, so much the stronger is the spasm, and is apt to extend up the arm. The moment he ceases writing the cramp ceases, and he can execute all other combined movements undisturbed. Narrow coat sleeves which compress the muscles, an inconvenient attitude, and above all a hard steel pen, favour the development of the affection. The disease is not entirely confined to the operation of

writing. Shoemakers, milkers, nailmakers, musicians, and men who handle small hard articles with considerable muscular grasp, are subject to similar cramps.

Treatment.—Rest from writing, and the electric current, along with milk or cod-liver oil. When the disease is beginning, syrup of the phosphate of iron, quinine, and strychnia, a teaspoonful daily.

Glosso-laryngeal Paralysis (Progressive Palsy of the Tongue, Lips, and Palate). (Rare.)—Embarrassment of speech first attracts attention, the tongue is less supple and the speech becomes thick, the patient cannot blow, whistle, or spit, and the saliva runs from the corners of the mouth. Food lodges between the teeth and cheeks, because the tongue is unable to displace it: at last the tongue lies motionless in the mouth, hollow in the middle, and with the edges raised. Palsy of the palate shows itself by the nasal voice, the palate hangs down and the tip of the uvula rests on the tongue; when food or drink is taken it regurgitates through the nose and mouth, and part may get into the windpipe, causing choking. The appetite remains good, but swallowing being impossible, constant hunger aggravates the distress. Great weakness of breathing is soon added to the other symptoms, so much so that the patient cannot blow out a candle. The disease is generally fatal, and death may ensue by stoppage of the heart's action, unaccompanied by pain or noise.

Treatment.—Electricity to the paralysed parts.

GROUP IV.

FUNCTIONAL DISEASES.

Tetanus (Lock-jaw) is a disease which consists of long-continued, intense, painful contractions

of some of the voluntary muscles. At the outset this effect is produced by the action of comparatively trifling irritants which, acting on the extremities of the nerves, throw the spinal cord into a state of excitement. As the disease progresses, the spinal cord remains permanently in a state of excitement independently of such irritants. The most common causes are injuries, especially punctured wounds, and sudden changes of temperature—hot days and cold nights. It may also arise independently of injuries, from exposure to cold, damp, and chills. Some poisons, especially poisonous doses of strychnine, produce exactly similar symptoms, the only difference being that the artificial tetanus is more rapidly fatal.

The symptoms usually begin some time in the second week after the injury, often a wound from a rusty nail, and the sooner the disease comes on the more likely is it to be fatal. The first thing noticed is a stiffness of the muscles of the neck, throat, and jaws, causing sore throat and stiff neck, and a difficulty in bending or turning the head. There is a peculiar appearance of the face, by the contraction of the muscles above the eyebrows. The stiffness and uneasiness soon increase and extend to the root of the tongue, causing difficulty in swallowing; the mouth opens with difficulty, and at last the jaws close completely, sometimes gradually, but always with great firmness. At length there is acute piercing pain and a sense of traction at the lower end of the breast-bone. When the disease proceeds the remaining muscles of the face, trunk, and extremities become involved, forming four different varieties, according as the muscles most affected bend the body backwards, forwards, sideways, or all muscles affected equally. The spasms never entirely cease except in a few cases during sleep, and there are aggravations of the spasms about

every quarter of an hour, the increase lasting for two or three minutes. In the most common form, that in which the body is bent backwards, in addition to the symptoms already described, which are those of lock-jaw proper (trismus), the other muscles of the face are affected, the forehead is wrinkled, the brows knit, the nostrils dilated, the angles of the mouth are drawn outwards, and the lips are drawn apart, exposing the clenched teeth, and giving to the patient a wretched grin (risus sardonicus). The eyes are rigidly fixed and sunk in their sockets. The characteristic of this variety, however, is the powerful contraction of the muscles of the back. When the paroxysms occur the middle of the body is jerked up, so that no part of it touches the bed except the back of the head and the heels. The muscles are as hard as stone, and are the seat of frightful pain, comparable to that of severe cramp of the leg. At the onset of the disease the paroxysms do not occur spontaneously, but are produced by the most trifling cause, such as a touch on the skin, a draught of cold air, shaking of the bed, slamming of a door, movements of the patient, and even mental emotions. The patient suffers from hunger and thirst which he is unable to relieve, the skin is covered with perspiration, the pulse is small and quick, the bowels are constipated, the temperature is very high, breathing is very difficult, the chest being compressed as in a vice from the contracted muscles; sleep, though ardently longed for, is impossible, or only got in short snatches; but, notwithstanding all this suffering, the intellect is clear and unaffected. As the disease progresses the paroxysms become longer and more frequent, and the short interval is less perfect. The patient lies with his arms close to his sides and his legs stretched out, fearing lest the slightest movement should produce a renewal of the paroxysm. Death gene-

rally occurs from the third to the fifth day, from breathlessness or exhaustion.

Treatment.—A uniform temperature, without draughts, in a darkened room. Moderate action of the bowels by an injection of a tablespoonful each of castor-oil and turpentine; ice applied along the spine. When the patient cannot swallow fluids, injection of milk and beef-tea, a small teacupful at a time. To soothe the pain, tincture of Indian hemp, 30 drops every hour, till its effect is seen; cautious inhalation of chloroform to relieve the paroxysm, and subcutaneous injection of curare, half a grain every six hours, are valuable but dangerous remedies, and should only be given by a medical attendant. I have had one case of recovery which I attribute to their use. In the event of recovery the muscles remain more or less contracted for five or six weeks.

Infantile Convulsions consist of a gradual but rapid contraction of some or all the muscles, making them hard and stiff, so that the joints cannot be bent, and soon followed by alternate contraction and relaxation. They may occur from the time of birth till the eighth year, and are most common in infants a few months old.

The cause may be (1) teething, worms in the bowels, or irritation of the skin; (2) terror and other emotions; (3) disease of the brain or spinal cord; (4) as a premonitory symptom of the various fevers and inflammations; (5) improper feeding, persistent diarrhoea and other causes of weakness; but the most common of all causes is indigestion or teething. There is often a marked hereditary predisposition to convulsions.

When the attack occurs suddenly without warning, it is almost always a premonitory symptom of one of the acute fevers or inflammations, and seems to take the place of the chill of older persons.

For a day or two before the fit the child is restless during sleep, and sleeps with its eyes half open, twisting its face and grating its teeth from time to time, and it starts when touched. When awake it is peevish and irritable, cries a good deal, and often changes colour. When attack begins, "the child may utter a cry, lose consciousness, become rigid as a deal board, and ultimately commence to struggle with a fixed chest and suspended breathing," then alternate contraction and relaxation begin over the muscles of the whole body, rarely on one side only, the limbs and fingers and toes are alternately bent and stretched out. The face at first pale becomes reddened and slightly bluish, the veins of the neck are swollen and project like cords, the eyes fill with tears, frothy saliva appears on the lips, the skin is bathed in sweat, and the belly is inflated from air which has been swallowed, the head is thrown back, the eyes are turned up or roll 'in their sockets, the face is distorted, and breathing is embarrassed. The spasms are at first rapid and limited, but gradually become slower and more extensive, till a long-drawn, deep breath, followed by complete relaxation, terminates the fit. The duration of the fit is usually a minute or two to half an hour, and there may be a succession of fits over a few hours to a day or several days. There are also local convulsions of one half or a part of the body. Children a few days old are apt to suffer from convulsions of the muscles of the throat and breathing; shown by rolling of the eyeballs during sleep, the eyes turned up, gentle moaning, difficult breathing, twitches of the muscles, and flushing of the face.

Treatment.—Loosen the clothing and admit fresh air, see if the dress has been too tight or a pin run into the skin. If teething, lance the gums where they are hot, swollen, and tender over a tooth;

endeavour to remove the cause; if it cannot be ascertained as soon as the child is seen to be convulsed, take a cot blanket, fold it in four, as you would a carriage rug when going to strap it up; hold this lengthways over a bath or sink and pour hot water at almost boiling heat over it, sufficient to saturate thoroughly; place the unfolded blanket over another dry one and wrap the child in the pack. In every case this small operation, which requires only a minute or so to complete, will cut the convulsion short, and before a medical man can reach the house the fit is over. This is infinitely to be preferred to the old-fashioned hot bath, which is not always at hand, and which nearly always causes great excitement and fright, very often making the child worse. Afterwards a small dose of calomel gr. iij., to give free movement to the bowels, does good. If there is continued stupor, cold lotions to the head; if indigestion, aromatic spirit of ammonia (sal volatile). If prolonged and the child cannot swallow, injections of beef-tea and milk, a few table-spoonsful at a time, one to six, according to the age.

Epilepsy (Falling Fits).—Is a complex condition in which there is sudden loss of consciousness, accompanied as a rule by convulsions, and followed by exhaustion and sleep.

The fit lasts from two to twenty minutes or more and returns at variable intervals. Epilepsy occurs at all ages, but generally begins between ten and thirty years of age, and in many cases there is an hereditary tendency to it.

Epilepsy may be conveniently divided into two forms: (1) where there are no convulsions, or only a few twitchings (pctit mal); (2) with convulsions. In the first form there may be only loss of consciousness for a few seconds, the eyes are fixed and the face pale; there are no twitches, but he lets

fall anything he may have in his hand. In a few seconds the attack passes off, and he goes on with his business as if nothing had happened, and those around him may not have noticed what has occurred. If slightly more severe, he suddenly becomes giddy and seats himself, or staggers and sinks to the ground without outcry; the face is pale, the eyes fixed, and a few convulsive twitches play over the face and arms. In a few minutes he recovers and looks wildly around, not knowing what has happened; but after a few minutes, during which he is confused, he is again fit for his business.

In the second form, which is the most common, there are in some patients warning symptoms, such as headache, spectral illusions, confusion of thought, a sense of fear, a peculiar sensation (aura), compared to a stream of cold water or cold air, tingling, warmth, numbness, or creeping of insects, which begins at the extremity of a limb and ascends to the head. As soon as this feeling stops the fit begins.

Whether warning symptoms are present or not, the attack usually begins with a peculiar, loud, and terrifying cry, the patient falling to the ground backward or sideways, convulsed and insensible, and his mouth covered with foam. Dr. Cheyne relates a curious instance of the terrifying effect of the cry: "On one occasion a parrot, himself no mean performer in discords, dropped from his perch seemingly frightened to death by the appalling sound."

The face is deadly pale at the moment of the fall, but immediately becomes flushed and red. The convulsions vary from the most trifling to the most frightful, terrific, and long-continued struggles. In mild cases only one limb or the face alone is convulsed, but in the severer forms the convulsions are general and violent. The hair

stands on end, the forehead is wrinkled and the brows knit, the eyelids are quivering and half open, showing the white of the eye, and the eyes are injected, convulsively rolling or squinting, the teeth are clenched, and the jaws are worked backwards and forwards so powerfully that the teeth are sometimes broken, the tongue and cheeks are often bitten, causing blood to mingle with the frothy saliva on the lips. Quick striking, twisting, and kicking of the limbs occur in turn and with such violence as sometimes to cause dislocation. The fingers are generally bent, and the thumb pressed into the palm of the hand. The breathing is difficult and snoring, the skin is bathed in sweat, rumblings occur in the stomach and bowels, and the stools and urine are passed unconsciously. During the entire fit consciousness is so completely extinguished that the patient is not aroused and does not betray signs of pain even by falling into the fire and charring a limb. When the paroxysm has reached its height the muscles relax and convulsions subside, breathing becomes free and the face natural, and the fit often terminates by a long, sighing breath and stretching of the limbs. After the attack is over, unless violently aroused, the patient generally falls into a deep sleep with snoring breathing. If awakened from this he looks blankly or anxiously around, does not know what has happened, and cannot account for being in bed or wounded; his sole desire is to be allowed to sleep. When he awakes he is sometimes in good health, but more often confused, low-spirited, exhausted, and suffering from severe headache, all of which vanish in the course of the day. In some cases every attack, or every severe attack, is succeeded by mental derangement which may amount to complete madness. The patient may have an irresistible inclination to run, or may break into a

violent rage on the slightest provocation. Memory and intelligence may be impaired or exalted for some days after the fit; there may also be temporary paralysis, loss of voice, difficulty in swallowing, or asthmatic attacks.

Weeks or months, and even years, may pass before the next fit, but every successive attack strengthens the habit and renders the individual more liable to future seizures, and at length the attacks become very frequent—several occurring in one day. Slight attacks at night during sleep may occur for a time, without being suspected by the patient or his friends, the fit being preceded and followed by sleep.

A repetition of attacks in course of time nearly always changes the mental and physical habits of the patient. Acuteness of judgment is lost; memory and the power of imagination diminish; the gentler and nobler impulses recede more and more; while the excited and unbridled propensities often impel the patient to commit violent or criminal actions. The patient becomes odd, capricious, troublesome, and apt to burst into violent fits of anger. The personal appearance is also changed: the features become coarse, with swollen eyelids, thick lips, a faltering look and clumsy body. The most beautiful countenance becomes deformed. Inveterate epilepsy often ends in permanent and incurable idiocy or insanity. The more distinctly hereditary it is, the longer it has lasted, the more frequent and violent the fits, and the greater the effects they leave, the less chance is there of recovery.

The causes are very various, the most frequent being hereditary tendency, and from intemperance and mental disturbance in parents, or marriages of near relatives. In children the irritation of teething or worms is also a common cause. Strong mental emotions, such as a violent fright, injuries to the

head, and pressure of tumours on nerves, are also important sources.

Where the epilepsy has been brought on by some temporary cause there is often spontaneous cure at puberty and at majority.

Treatment.—1. *During the fit.*—The chief object is to prevent the patient hurting himself. He should be placed on a sofa or bed with the head raised and the dress immediately loosened; fresh air should be freely admitted, and cold water applied to the head; a piece of cork or soft wood should be placed between the teeth to prevent injury to the tongue, and the result awaited. The patient should not be bound or held fast during the fit. After it is over those generally feel best who have been allowed to struggle through it unmolested. Whenever circumstances permit an epileptic should not be allowed to go unwatched, so as to give assistance if needed; for example, during a fit in bed he might turn on his face and be suffocated.

2. *During the interval.*—Diligently search for the probable cause, and, if possible, remove it. The patient's general health, diet, occupation, and habits, mental and otherwise, must all be inquired into to endeavour to find the origin.

When there is severe headache, a blister to the back of the neck and purging by a compound colocyath pill are of use. If there are worms in the bowels, eight drops of turpentine daily for three days should be given; turpentine seems to do good independently of its action on the worms. If a sear or tumour presses on a nerve, removal by operation may cure the epilepsy. Many remedies have been employed with more or less success in epilepsy, such as belladonna, quinine, iron, valerian, sulphur, camphor, etc.; but the most successful hitherto has been bromide of potassium in considerable doses and long continued. For a man, 10 grains

three times daily, increasing to 15 grains after a fortnight. The good effect is shown by the fits occurring at longer intervals, and especially by their growing feebler. Latterly the bromide of strontium has been employed with success in cases where the potassium salt has failed. When a warning symptom (aura) runs up a limb, a strap buckled tightly round the limb where it is felt sometimes prevents the fit, but the next one is said to be more severe in consequence. Epilepsy is nearly always suspended during the course of acute fevers, and is sometimes permanently cured in this way. When there is sleeplessness in an epileptic, hyoseyamus is to be preferred to opium, because opium causes congestion of the spinal cord. The sufferer must never be allowed to be where the occurrence of a fit might occasion an accident. The bed he sleeps in should be low, lest he be injured by a fall; the fire in his room should be protected by a strong guard; riding on horseback, or in a gig or coach, shooting, fishing, and the like should be forbidden; but gentle exercise in the open air in the company of a friend or a few companions he may safely indulge in. He should have nourishing diet, warm clothing, and moderate exercise of both mind and body.

Impostors sometimes feign epilepsy to excite charity, and are occasionally caught in their own trap, the sham fits finally inducing real epilepsy. The impostor does not fall violently, but throws himself down in such a way as to avoid injury; the pupils of his eyes contract with light instead of being insensible to it as in a true fit; his skin is hot instead of cold and clammy; the tongue is not bitten, and a pinch of snuff blown into the nostril changes the fit into one of sneezing.

There was a beggar in Paris who often fell into epileptic fits in the street. One day some compas-

sionate spectators, fearing lest he should hurt himself in his struggles, got a truss of straw and placed him on it, but when he was in the height of his fit and performing remarkably well, they set fire to the straw, and he presently took to his heels.

Cramp (Spasms).—Cramps are continued or interrupted contractions of the muscles, not caused by disease of the brain or spinal cord. It is usually attended by rigidity, much pain, and lasts for a short time. It may attack either voluntary or involuntary muscles. Of the former, the calves of the legs, feet, neck, and hands are the most frequent; of the latter, in the stomach, or cramp of the bowels (colic).

The following are the chief varieties of cramp:—

1. *Spasm of the Muscles of the Face (Mimic Spasm of the Face).*—Grimaces occur either intermittent or constant, involving one side of the face, rarely both; the attacks set in suddenly, and as suddenly subside. The muscles feel hard and tense and impede motion, so that the eye on the affected side cannot be completely closed. At first the affected side is painful, but the pain soon abates.

2. *Of the Muscles of the Neck (Nodding Spasm, Salaam Convulsions).*—There is rapid contraction of one or both the front muscles of the neck, causing incessant nodding of the head like a Chinese image. Sometimes the nodding has occurred as often as one hundred times a minute.

3. *Of the Limbs.*—This is the most common seat of cramp, and is not unfrequently caused by rheumatism, cold, damp, or irritation of the bowels. The attack is sudden, and often occurs by night, the patient being awakened by it from sleep. During its continuance the muscles are gathered into a knot, which is always easily felt and may often be seen. The pains attending it are very severe, sometimes so agonising as to cause fainting.

4. *Spasm of the Bladder*, which is generally reflex, and causes great distress with sudden violent desire to pass urine.

Cramp usually lasts only a few moments, but it may last for hours, and leaves for a time a soreness to touch and inability to use the part. The attack may cease gradually or suddenly, and may be limited to one muscle or extend to several. Some people have a remarkable tendency to cramp; movement of certain muscles—as, for example, in crossing the legs—being almost certainly followed by it.

Treatment.—During the attack kick out the leg and attempt to walk, or rub the muscles, if on the trunk, with a warm hand or dry flannel. If persistent, hot fomentations. Attend to the general health. Very commonly there is a disordered state of the stomach and bowels, which must be remedied; usually 8 grains of rhubarb and 12 grains bicarbonate of soda daily for a short time. If gout or rheumatism exist, their appropriate treatment.

Child-crowing (*Laryngismus Stridulus*).—Is a spasmodic affection of the windpipe, of nervous origin, and occurs almost solely in infants and young children, most commonly between the fourth and tenth month. A constitutional predisposition to it often exists, as in some families almost all the children in succession are affected. The attack is sudden and without warning, except in a few cases where there is slight breathlessness. Like croup, for which it is sometimes mistaken, the seizure usually occurs at night; the child suddenly awakes or is attacked while awake with sudden difficulty of breathing, the breath is drawn in with a loud whistling noise, compared to the crowing of a young cock, and which is produced by the contracted muscles narrowing the cleft of the windpipe (glottis).

The eyes are fixed and staring and the face shows

great distress, the child sits up or bends forward to favour breathing, and not unfrequently there are steady (tonic) contractions of the thumbs and fingers which are bent towards the palms, and of the toes which are bent towards the soles of the feet; these contractions are attended with pain, and any attempt to straighten the fingers or toes always causes more pain. If the fit continues for any length of time, the face and limbs become bluish or purple. At length the paroxysm ends as suddenly as it came on by a forcible expiration, generally followed by a fit of crying. After a few minutes, as soon as the child has forgotten his fright he is completely restored, or if the fit has lasted some time, he is completely exhausted and falls asleep. The fit may return in a few hours or days; when they follow one another rapidly they are apt to be accompanied by general convulsions and to prove fatal. There is always a great tendency to relapse, which is to be feared for a considerable time, even for months afterwards. The disease is a reflex action from some irritation, the ordinary ones being: (1) irritation from teething; (2) irritation of the bowels from improper food or overfeeding, worms, constipation or diarrhoea; (3) irritation of the skin, usually from eruptions on the scalp; (4) enlarged glands in the neck pressing on nerves.

Treatment.—Place the child in a warm bath and dash a little cold water over the head and face, hold a sponge filled with hot water to the throat, and when it cools dip it again into the hot water and reapply it. Slap the chest with a towel dipped in hot water; the vapour of ammonia to the nostrils; as a last resource, opening the windpipe (see p. 245.) During the interval between the fits measures should be taken to prevent its recurring. Lance the gums if they are swollen, hot, and tender. Give bromide of potassium in 2-grain doses every four hours.

Attend to the state of the bowels; a purgative is usually required, such as a teaspoonful of castor oil. If there is a skin eruption, soothing applications such as dilute solution of acetate of lead. If there are enlarged glands, a teaspoonful of cod-liver oil with five drops of the iodide of iron twice daily. If possible, a change to a dry warm climate, not necessarily at a long distance.

Differences between Child-crowing and Croup.

Child-crowing.	Croup.
1. No warning symptoms.	1. Feverishness, hoarseness, and dry cough.
2. Attack sudden.	2. Attack not so sudden.
3. No fever or cough.	3. Fever, thirst, and ringing cough.
4. Breathing is free in the intervals.	4. Breathing more or less affected during the whole duration.
5. No false membrane.	5. Shreds of false membrane are coughed up.
6. Improvement sudden.	6. Improvement gradual.

Chorea (St. Vitus's Dance: Madness of the Muscles).—Is an irregular convulsive action of the voluntary muscles, especially of the face and limbs. It is rare before the sixth year and after the fifteenth, and is most common at the periods of second dentition and approach of puberty.

The affection is more common in girls than in boys, and as a rule begins very gradually.

The child seems awkward and often drops things; in eating, the fork misses the lips, and in drinking, the beverage is apt to be spilt; the child does not sit still, and makes grimaces which may wrongly be attributed to mirth or mockery, and for which it may be scolded or chastised with the result of making

the affection worse. Patients suffering from chorea are unusually sensitive and very easily alarmed ; in mind as in body, never constant but rapidly changing from one idea to another. As the disease progresses by degrees almost all the voluntary muscles are affected ; in the face the eyebrows are alternately contracted and relaxed, the forehead wrinkled and smoothed, the eyelids rapidly winked and then fast closed for a moment, the eyes roll, the mouth successively pursed up, opened and closed, drawn into a smile and drawn down as in weeping ; the tongue is often thrust forward, the arms are jerked about, and movements occur in the elbows, hands, and fingers. The legs are also affected, though to a less extent, giving a characteristic gait to the patient while walking. The voluntary movements are awkward and uncertain from being complicated with the involuntary. The face looks vacant and foolish from the different movements, though the mind is quite sound. The movements get worse when the patient is watched, or when she pays much attention to them. One side is generally more affected than the other, or it may be confined to one side or to the muscles of the face. The speech becomes impeded, the temper irritable, and the appetite irregular, but the general health is little affected. From the constant movements it is difficult for the patient to get sleep, but when once asleep the movements cease. The duration of chorea varies from six weeks to four months, and is often preceded, accompanied, or followed by rheumatism or heart disease. The cause is often obscure, but seeing a person affected with it is apt to cause an attack in children predisposed to it, and from this cause it has sometimes been epidemic in boarding schools. A sudden fright is not an unusual cause, as is also irritation from the teeth or worms in the bowels.

Treatment.—Remove the cause if possible; have an irritating tooth pulled out; if there are worms a dose of santonin (see MAT. MED.); have the bowels moved by 2 grains of calomel at the beginning of the attack. A daily cold shower-bath, or for delicate children use tepid water for a time at least. Carbonate of iron, 3 grains thrice a day, after food, and along with it three drops of solution of arsenic (liquor potassæ arsenicalis) thrice a day, carefully watched till some of the specific effects are seen (see MAT. MED.). To procure sleep, if necessary, $\frac{1}{4}$ grain of the extract of Indian hemp. The food should be light and nourishing.

Hysteria.—Is a disturbance of the nervous system characterised by extreme perversion of the sensations. It is almost exclusively confined to females, and usually occurs from the time of puberty to the change of life.

There are two mental conditions generally found in hysteria, although they are not peculiar to it, but belong rather to invalidism in general. One is a tendency to imitation, in which the patient believes she is afflicted with any disease which may strike her imagination or which she chancées to hear of. The other is a diseased egotism which makes her delight in being ill, so that it secures the undivided attention and sympathy of those about her. This is at the bottom of those marvellous and otherwise unaccountable tricks which hysteric patients resort to in feigning disease. A tendency either from birth or acquired by injudicious training has an obvious influence on the production of hysteria, the forms and degrees of which are so numerous as to make it very difficult to describe it properly.

It is usually divided into three forms:—1. Where there is the sensation of a ball rising in the throat (*globus hystericus*), or a feeling of suffocation is felt but without convulsions.

2. The hysterical fit, where the sensation of a ball rising in the throat is accompanied by convulsions.

3. Irregular and anomalous forms which often occur in the intervals of the paroxysms.

The milder forms, which terminate without a fit, begin with pains generally in the left side, or the patient is unusually nervous, excited or depressed; after a time there is the sensation of a ball rising from the stomach to the throat, sometimes causing an intense feeling of suffocation. The attack then ceases and is followed by weariness, headache, a copious discharge of pale urine and great flatulency.

The fit of hysterics may be preceded by pains and mental feelings, but often is quite sudden and is aggravated by some passing excitement. The patient bursts into a fit of convulsions, laughing or crying, the sensation of a ball begins, and as soon as it reaches the throat she falls to the ground apparently unconscious and violently convulsed. During the fit she may beat her breast with her hand, knock her head against the bed or floor, tear her hair or clothes, laugh or cry, scream, shriek, or sob. The face is flushed, the head is generally thrown back so that the throat projects, the eyelids are closed but quivering, the nostrils distended. During her struggles she may bite herself or the bystanders, and breathing is rendered slow and difficult.

The fit generally ends with a flood of tears or a fit of laughter, followed by a great flow of clear urine, when recovery is complete. In other cases, the patient lies exhausted and unwilling to be disturbed, and though more or less conscious of what has passed, she wishes to be thought ignorant of all that has taken place. Occasionally the action of the stomach becomes inverted and the fit ends with vomiting, and may be followed by quiet sleep.

Irregular hysteria between the fits is still more various in its manifestations, and may simulate any disease.

There is exalted sensibility or morbid irritability of one or more of the senses. In some the sense of touch is exalted so much that they can scarcely bear the weight of the bed-clothes; they can perceive the most trifling differences in weight and temperature, and are thus able to distinguish objects with their eyes shut which people in health could not. The sense of smell may be exalted to a degree usually found only in brutes. In like manner sight, hearing, and the sense of taste may also be increased. They often cannot endure bright daylight, the odour of flowers, or spice in the food, and desire us to speak in a whisper. Some hysterical patients who cannot endure the odour of flowers can tolerate, or are even gratified by, various disagreeable smells, such as the odour of burnt feathers or assafoetida.

From the morbid increase of sensibility, many complain of pains in various parts of the body, the most common being headache fixed to one spot and feeling as if a nail had been driven in. Hysterical breast, in which the pain is severe and long continued, the patient being scarcely able to bear the rubbing of the dress. Pains in the joints, usually the knee and hip, and which are often of such severity and so long continued as liable to be mistaken for grave inflammation. Hysterical imitations of hip-joint disease cause no wasting of the muscles nor painful starting of the limb at night. A light touch on the skin is generally more painful than a heavy pressure; the reverse of these take place in the true disease.

Imitations of inflammations may be detected by the thermometer showing no increased temperature as it would in a real inflammation.

According to Sir Benjamin Brodie, among the

upper classes, at least four-fifths of the female patients who are supposed to labour under diseases of the joints, labour under hysteria and nothing else.

There is almost never-failing tenderness on pressure over the spine, which may be exquisitely severe, and has often been mistaken for disease of the spine. With respect to these supposed cases of disease of the spine, Mr. Skey says : " In reference to the spinal affection in young persons, I unhesitatingly assert that real disease is not found in a greater proportion than one case in twenty, and even this is a liberal allotment. . . . These examples are but a miserable mockery of the reality, and a fraud on the judgment of the ignorant."

In some cases palsy either of a limb or one side of the body occurs from excessive incapacity of the patient to make up her mind to move the limb, and so long as she is firmly persuaded that she cannot move it, she is really incapable of moving ; but even after it has lasted for months it may be cured by a sudden strong emotion, such as fright from the house in which she is getting on fire.

If any serious disease is simulated in hysteria, its symptoms should be carefully examined, as the patient's exalted sensibility may detect premonitory symptoms of the disease which are as yet unrecognisable, and so cause the patient to elect that disease for simulation. I have seen an hysterical imitation of apoplexy and general paralysis when all the indications were against such a disease, the patient making a perfect recovery in a few days, and yet where subsequent death by apoplexy occurred about a month afterwards.

From the increased sensibility many things are complained of as causing pain and uneasiness, of whose action we are unconscious during health. Thus the movements of the bowels, stomach, and

heart are described as giving rise to peculiar sensations.

Among the mental symptoms the most prominent is the rapid alternation in spirits of the patient, passing suddenly from gaiety to gloom. As the real and imaginary impressions geuerally fill the patient with disgust or displeasure, she gradually becomes more and more depressed, sad, and unhappy, till at length the constant and apparently unreasonable lamentations and weeping tire out the sympathy and attention of her friends and relatives, to regain which patients have undergone the most painful operations. The capacity of such a patient for inventing conditions calculated to excite notice or sympathy is something incredible; hence we should accept all unusual reports with the utmost distrust, such as that she never takes food, that she never passes stools or urine, that she has vomited blood, etc. The late Dr. Hughes Bennett detected a clever imitation of spitting blood from the lungs, by finding under the microscope that the blood was that of a bird.

Another form of hysteria is where the patients live in bed; they are tranquil, cheerful, have good digestion, and like the sympathising attention of their friends. They often believe there is a serious disease of the spine or womb, and that certain movements cause great pain. Much tact is required to persuade the patient to get well.

Sickness, belching of odourless air, rumbling in the bowels, flatulence, feeling of fainting, palpitation, and frequent passage of an abundance of pale clear urine are characteristics of hysteria; a certain constitution is also characteristic. The hysterical face may be recognised by the remarkable depth and prominent fulness of the upper lip, which is more or less thick, there is also a fulness of the eye with a tendency to drooping of the upper eyelid.

Causes.—Feebleness and bloodlessness, some derangement of the sexual functions, depressing emotions such as the loss of a husband or child or disappointed love, sudden fright, etc. Hysteria is much more common among the middle and upper classes than among the poor. Patients who can command the sympathy of friends and the attendance of a physician often fail in the mental resolution necessary to resist the attack and throw off the sensations of fictitious fatigue, while poor people cannot afford the luxury of indulging in hysteria and must exert themselves to resist the sensations.

Treatment.—During a fit let the patient be laid down, the dress loosened, and fresh, cool air freely admitted, ammonia applied to the nostrils, and if the attack is at all severe, there is more virtue in cold water than any other remedy. Sir Thomas Watson says, that before the introduction of cold water, three or four patients might be seen hysterical in one ward of the hospital; but after its use hysterical fits became rare and seldom occurred twice in the same person. A few quarts of cold water thrown on the person of the chief offender instantly brought the ward into a state of tranquillity. Uneducated bystanders, seeing how manifestly the fits depend on mental influences, are very apt unjustly to suspect the patient of imposture; there are real feelings and sufferings, but the patient does not try to resist them and exaggerates their effects.

Sympathy and kindness aggravate the fit, while severity and cold water dashed in the face prevent it.

During the intervals, attend to the general health, moderate exercise in the open air, a daily shower-bath, and for a time 10 drops each of assafoetida and ether thrice a day.

Distinguishing Points between Hysteria and Epilepsy.

Hysteria.	Epilepsy.
1. Unconsciousness, partial, incomplete, and gradual, with sighing, laughing, and sobbing.	1. Loss of consciousness, sudden and complete, and therefore no expression of feeling.
2. Sensation of ball rising in the throat present.	2. Peculiar sensation running up a limb present.
3. Convulsions uniform and interrupted, never of the face.	3. Convulsions more on one side and at first steady, face distorted.
4. Face flushed, eyelids closed, eye fixed; no grinding of teeth or biting of tongue, pupils contract with light.	4. Face livid, frothy saliva over the lips, eyelids half open, eye rolls, grinding of teeth, biting of tongue, pupils insensible to light.
5. Paroxysm long.	5. Paroxysm short.
6. Followed by wakefulness and depression of spirits.	6. Followed by deep sleep, partial stupor, headache, and dulness of intellect.
7. Attack most common during the day.	7. Attack most common at night.

Neuralgia.—Violent pain which returns in the part with renewed violence after periods of temporary remission. In some cases neuralgia is a symptom of various cachexias, *i.e.*, morbid state of the system such as rheumatism, chlorosis, anæmia, malaria, and lead-poisoning. In other cases it is reflex (reflected) from various inflammations, as a decayed tooth or piece of bone; from wounds of nerves by sharp instruments, or from pressure on nerves as by a scar or growth of a tumour.

There are two forms of pain to be distinguished; one is a dull, continuous pain confined to certain

points and increased by pressure; not very severe, but annoying and persistent. After this has lasted some time, the second form occurs in paroxysms, spreading from a point, the pain is deep-seated and agonising, generally lasting for a few seconds only, but causing exquisite torture.

The principal varieties of neuralgia are

1. *Facial Neuralgia. Tic Douloureux.*—Usually one, sometimes two, and seldom all three branches of the fifth nerve, which supplies sensation to the face, is attacked.

The pain is in the forehead, eyebrow, and upper eyelid, sometimes also in the eye when the first branch is attacked; after some time violent twinges of pain occur which last for a few seconds to minutes and return at irregular intervals.

When the second branch is affected the pain is felt in the lower eyelid, the side of the nose, the upper lip, and teeth of the upper jaw. If the third branch be involved there is pain in the teeth of the lower jaw, the chin, and lower lip.

The attacks may come on spontaneously or may be excited by speaking, sneezing, blowing the nose, chewing, hot or cold food, or even mental excitement.

2. *Brow Ague, Megrims, Hemicrania, Sun Pain.*—Is a combination of headache and neuralgia occurring in paroxysms and confined to one side of the head. It often commences in childhood and lasts till advanced age, occurring a few times every year.

It occurs in both sexes, but much more frequently in women, usually during the monthly periods, and tends to diminish after middle age. The attack begins gradually after waking in the morning with slight chilliness, loss of appetite, slimy taste in the mouth, sickness and intense headache; the eyes are very sensitive to light and the ears to sound, so that the darkest and most retired rooms are sought for

and absolute seclusion desired. At the height of the attack there is often vomiting of a bitter, greenish fluid. Generally towards evening the patient falls asleep and awakes next morning free from pain, but much depressed and exhausted.

It is best not to try to defy the attack, but go to bed early and abstain from food and medicine till the attack is over.

3. *Sciatica*.—Acute pain down the back of the thigh and leg. It is one of the most frequent forms of neuralgia, occurring most commonly in men over twenty years of age. Rheumatism, gout, and catching cold are the usual causes. The attack as a rule begins gradually and slowly becomes severe. Tension of the fascia (an inner sheathing under the skin) usually makes the pain worse, to avoid which the patient generally keeps the leg bent and places the foot very carefully in walking, any quick motion or mis-step causing severe pain. If effusion takes place within the sheath of the nerve, there is intense pain, cramps, and starting of the limb, succeeded by a dull aching, benumbing pain, and a feeling as if the limb were swollen.

Sciatica is usually a very obstinate disease, lasting for months or even years, and liable to relapse. Even in favourable cases it lasts for several weeks and subsides gradually as it began. In chronic cases the affected limb is often sensibly wasted from want of use.

4. *Intercostal Neuralgia* usually attacks the spaces between the ribs. It is more frequent in women than in men, and more common on the left side than the right. There are often three spots very sensitive to pressure, so that the patient cries out if they are touched. One is near the spine where the nerve leaves the spine, another is on the side where the nerve divides into two branches, and the third is near the breast-bone where the nerve ends. The

darting pain generally starts from the spine and passes forwards. The constant pain is increased by a deep breath, sneezing, coughing, touching the sensitive spots, and sometimes by moving the arms. Hard pressure not unfrequently relieves the pain.

5. (*Mastodynia*) *Irritable Breast* is neuralgia of the nerves of a breast, usually in women under thirty years of age. Without any perceptible cause the breast becomes sensitive to the slightest touch at one or more points, and intense pain occasionally shoots out towards the shoulders, armpits, or hips. The patients cannot lie on the affected side and are unable to bear the weight of the breast, which may be slightly swollen, and at the height of the attack vomiting may come on. Sometimes the pain is of a wearying, aching character, and there may be small movable tumours of connective tissue, the size of a pea to a hazel-nut, from which the pain starts. The disease often lasts for months or years without any perceptible change in the breast, and causes great anxiety as well as pain, for the patients generally dread "a cancer in the breast," especially when there are little painful tumours. The general health is seldom good and should be attended to. A belladonna plaster should be worn over the breast to relieve the pain and a fur to shield it from the cold.

In all the varieties of neuralgia there is tenderness of the skin where the affected nerve leaves the main trunk, seldom lessened sensibility. The nerves which pass through narrow openings in the bones, and supply parts of the skin exposed to cold, are the most often affected, *e.g.*, tic and sciatica.

Treatment.—Endeavour to remove the cause if possible. During the paroxysm, if it is periodic, *i.e.*, returning at fixed intervals, 6 grains of quinine along with a glass of wine or a cup of hot tea. In all cases a blistering fluid painted over the sensitive

portion of skin, or if it is not at hand a mustard plaster. Holding the head over steam or a warm bath is often useful in facial neuralgia. A moderate purging (the amount of the purgative depending on the habit of the person) such as by a compound colocynth pill. To relieve pain if very intense, 3 grains of croton chloral every three hours. Antipyrin in 7-grain doses will be found to relieve neuralgic pains in the face and forehead when other drugs have failed. When neuralgia is very obstinate, electricity, as a constant current from a battery, is often of use. Chloroform liniment, aconitina ointment, belladonna plaster, externally, and subcutaneous injection of morphia $\frac{1}{8}$ grain, carbonate of ammonia 4 grains every four hours. extract of stramonium $\frac{1}{2}$ grain, have all been used with more or less success.

In sciatica caused by constipation, one drop of croton oil. If from rheumatism, iodide of potassium 6 grains twice a day; warm baths—the general treatment of rheumatism—do good.

Between the paroxysms of neuralgia the health must be improved. In pale, bloodless patients cod-liver oil—a tablespoonful daily—along with carbonate of iron, 3 grains, three times a day after food. Cold shower bath. It is often connected with dyspepsia.

DISORDERS OF THE INTELLECT.

The premonitory symptoms of impending cerebral mischief can often be detected by the physician some time before they attract the attention of the patient or his friends. The most usual are morbid alternations of temper, depression of spirits, severe and frequent headache, severe giddiness, loss of memory and confusion of mind, paroxysms of irritability and loss of temper without sufficient cause,

inaptitude for business, weariness and fatigue of brain, a longing for death, a want of interest in former pursuits, restlessness by day and sleeplessness by night, defective speech and flightiness of manner. The sufferer feels that he is not right, but does not like to consult a physician; he shuns his old friends and may be tortured with blasphemous or obscene thoughts.

It is, however, *very* common for patients out of health, especially from disorders of the digestive system, to suffer much needless anxiety and to be harassed by unfounded fears of going mad; loss of memory, confusion, giddiness, restlessness, etc., occur from fatigue and want of attention, and the patient, becoming frightened, broods over his state till it becomes much worse, and presents a nervous imitation of commencing madness. These symptoms will disappear with the improvement of the general health, and should cause no anxiety.

To judge of his condition the individual must be compared with his former self, which is the only safe rule.

Mental diseases are often accompanied by bodily disorders.

Mania (Raving Incoherence or Madness).—Is a disorder of the impulses with one or more of the passions almost always exalted. The reasoning faculty, if not lost, is disturbed and confined. The ideas are abundant, erroneous, absurd and wandering; and the manner violent and excited.

It may be acute or chronic, and rarely comes on suddenly. At first there may be only trifling irregularities in the affections. The maniac may at first be either sad or gay, active or indolent, indifferent or indolent; but he soon becomes impatient and irritable, neglects his business and family, and does the most strange and extravagant acts. Delirium and reason alternate with each

other, and so do causeless anger and despondency. The kindest domestic love merely irritates and provokes him to the utmost fury ; he shows distrust of his relatives, sleeplessness sets in, and his mind becomes a perfect chaos ; all is violence, effort, disturbance and disorder. Shouting, howling, laughing, etc., for hours together, with ceaseless angry, furious, or destructive movements. He shows aversion to food and gradually becomes weak and exhausted. It is seldom that he is insane on one point only, as in monomania. Recovery is preceded by sleep, a desire for food, and a gradual cessation of agitation and delirium.

Different varieties of mania are—

Homicidal, the result of delusions, suspicions, or enmity. A plausible reason is usually given for the attempt to kill—such as that the victim had persistently annoyed or conspired against the lunatic. Such homicidal impulses may exist with perfect ability to manage all his business, and his behaviour otherwise may be quite correct and even considerate.

In suicidal mania there is a desire for suicide often by one particular method.

In kleptomania there is an irresistible desire to steal, usually articles of no manner of use to the kleptomaniac.

In pyromania the impulse takes the form of fire-raising.

In monomania there is usually one particular delusion. He may act quite rationally in other things, and even in his delusion there is often method in his madness. Thus a lunatic who fancies himself made of glass will carefully avoid all sudden movements lest he should be broken in pieces.

Melancholia usually comes on gradually. The patient becomes silent and seeks entire solitude,

forgetful, abstracted, in low spirits, indifferent, and shuns all exertion. There is loss of sleep, disturbed dreams, and disordered digestion. He is easily moved to tears, disregarding all consolation, and is unwilling to move, talk, or take food; while there is a great tendency to commit suicide. There is often a fixed dull pain or sense of oppression in the head, which is bowed on the chest. Answers to questions are given in monosyllables, or after a considerable pause. It occurs in three forms—as religious, hypochondriacal, which is usually associated with indigestion, and home sickness, where death results from general exhaustion.

Dementia.—The condition of intellect in which weakness is the prominent feature. It may follow mania, melancholia, or sunstroke, or come on in extreme old age. The mental faculties become dulled, confused, and finally altogether obliterated. If long continued there is a vacant and puzzled look, a lack-lustre eye, a weak smile and a meaningless laugh. The ideas are confused, vague, and wandering; the memory is much impaired—they forget what they have just seen or heard, and are ignorant of the most common properties of time, place, and quantity. The manners are hesitating, silly, and childish. They have neither affections nor aversions, but have paroxysms of excitement and restlessness. There is little control over the bladder and bowels, and in the last stage they may pass into complete paralysis.

General Paralysis of the Insane.—There is failure of nerve power, muscular weakness, and convulsions of the nature of epilepsy and apoplexy combined, with degeneration and wasting of the brain, leading to complete paralysis of body and mind.

The muscular weakness in this disease has been called "the pulse of insanity."

The disease begins with a sense of weariness and fatigue after little exertion in the lower limbs. The patient is restless and walks to and fro without any definite object. As the disease advances more attention is given to the walk; the steps are short and shuffling, the foot comes down flat on the ground, while the legs are thrown outwards, straddling rather than walking. The first symptom is often an impediment to the movements of the tongue, causing hesitation and defective speech, accompanied by convulsive tremblings of the lips. The speech becomes thick, like that of a drunken man, and the face becomes a mask devoid of intelligence. When the patient is made to stand he balances on both legs as equally as possible, and the position of the hands and arms is constrained. Muscular weakness may exist for some time before the mental disorder shows itself. When it appears it is characterised by delusions of grandeur, such as possession of great wealth or power. I have seen a hospital patient collect a number of half-pence in a match box, firmly persuaded that they were sovereigns and that he was possessed of enormous wealth. The patient is generally in high spirits and good humour, except when thwarted or contradicted, when he bursts into a violent rage and may be dangerous. The temper is irritable and suspicious, and his ideas vary from day to day. The intellect gets slowly weaker, the memory fails, the handwriting gets changed, the moral character gets debased, the patient is apt to fall and get knocked about without feeling pain; on putting out the tongue it curves tremblingly from side to side; the pupils, which are contracted at first, become subsequently dilated and slower in responding to light. The stools and urine may pass involuntarily, either from paralysis or want of attention, and convulsive seizures are not uncommon.

As the disease progresses swallowing gets impaired, the mouth is filled and the food rolled from side to side. There is also danger of its getting stuck in the throat and choking the patient. Reflex action gets weakened and also the irritability of the muscles to electricity. All instinct of decency gets lost. The patient gradually gets unable to speak a single word, and cannot walk or stand from weakness, but continually grinds his teeth. Finally, all traces of intelligence are lost; he remains motionless, insensible, in a state of living death. Death generally takes place suddenly during or after one of the convulsive attacks, which if he survives leaves blood poured out on the brain (hæmatoma).

The symptoms steadily advance from bad to worse, with occasional remissions. Few survive for three years, the average duration being about thirteen months.

Treatment of Disorders of the Intellect.—*Preventive.*—Rest of mind or change of occupation. Change of air and proper attention to any bodily disorder.

Curative.—When there is any suppressed discharge leeches to the thighs or behind the ears are often useful. In acute mania prolonged hot baths, eight hours at 82° F., while a small stream of water at 60° is continually poured over the head, will often procure sleep more certainly than medicine. To procure sleep chloral hydrate is generally to be preferred, beginning with fifteen grains, and, if necessary, increased next night. One-sixth of a grain of acetate of morphia by subcutaneous injection is also a useful remedy. If the bowels are constipated, one drachm (a teaspoonful) of sulphate of magnesia (Epsom salts) in a tumbler of camphor water may be needed.

In melancholia 10 drops of dilute nitric acid in

2 tablespoonsful of infusion of calumba twice daily, after breakfast and dinner. A daily shower bath and open-air exercise.

When food is refused any derangement of the stomach or bowels should be removed, and if the patient still refuses food he should be fed with the stomach pump, or, if one cannot be procured, by injections of milk, beef-tea, and beaten-up eggs, a small teacupful at a time.

For moral treatment the patient should be removed from his family at once in slight cases, that he may be induced to exercise such command over himself as he possesses, and to remove him from influences which may have aggravated the mischief; in severe cases, to prevent him doing mischief to himself or others.

All harshness and mechanical restraint must be avoided, and the patient's confidence obtained if possible. Every promise that is made must be kept, and as much indulgence as possible allowed. In certain conditions of excitement, however, it is proper to place the patient at once in a darkened room, remote from noise and from the means of injury to himself or others, so that as few objects as possible may irritate him. The effect is generally soothing. "There are no more powerful medicines than occupation, recreation, and education. Occupation should be such that there is no time for idleness or brooding over morbid fancies."

When reason is restored and the emotions are under control the patient may be allowed to see his friends and to attend to the affairs of his family. It should, however, be remembered that the mind remains weak and enfeebled for some time after apparent recovery, and hence the patient's restoration to society should be gradual.

Forms of Unsound Mind.

Amentia—undeveloped intellect.	Dementia—degenerate intellect accompanied by languor.	Mania—disordered intellect accompanied by undue excitement.
1. Idiocy.	1. Acute or primary.	1. General (raving incoherence).
2. Imbecility.	2. Chronic or secondary.	2. Intellectual. a. General. b. Partial : <i>Monomania.</i> <i>Melancholia.</i>
3. Cretinism.	3. Senile dementia.	3. Moral. a. General. b. Partial : <i>Homicidal.</i> <i>Suicidal.</i> <i>Kleptomania,</i> etc.
	4. General paralysis of the insane.	

CHAPTER II.

AFFECTIONS OF THE EYE.

(First read the Table of Contents.)

THE eye, considered merely as an optical instrument, is a wonderfully beautiful and complicated structure, resembling in many respects a good telescope. Diseases of the interior of the eye, and most of those affecting vision, require to be treated by a skilled specialist, and the eye to be examined by an ophthalmoscope. The following short account of the structure and use of the parts of the eye may be of interest.

The *eyelids* consist outside of thin skin, and on the inside of a smooth membrane, the conjunctiva; between them lies a small circular muscle (orbicularis) going round both eyelids, the contraction of which shuts the eye. Next there is a small half-oval cartilage or gristle (tarsal) with straight edge along the edge of the lid, and the round edge joined to a still thinner ligament (palpebral) or membrane which is joined to the bone round the eye. Next there is a row of fine straight tubes (Meibomian glands) like a hair lying on the inside of the lining membrane (conjunctiva), and the mouths of which open on the free edges of the eyelids. Finally the eyelashes are set in two or more rows at the junction of the skin and lining membrane, the upper lashes being longer and more curved, which prevents their tangling.

The *conjunctiva* or lining membrane, after lining the eyelids, turns forward on the eyeball, a few glands opening into the fold. On the ball it becomes thinner, transparent, containing a few tortuous blood-vessels, and is loosely connected to the ball by a little tissue, so that it can be moved on pressing the ball with the finger; over the clear part of the eye it is not movable, and is reduced almost to nothing. Through the ducts it is continued into the nose and lachrymal gland.

The *lachrymal gland*, which secretes the tears, is about the size of a small almond, and lies at the upper and outer side of the eye, one part being attached to the back of the upper eyelid, the other part to the bone. The ducts of the gland, about a dozen in number, open into the fold where the conjunctiva turns forward. At the inner edge of the eyelids near the nose are two small projections, each with a minute opening (puncta) at the top, which convey the tears by two small ducts into the lachrymal sac, which is a small sac at the top of the nasal duct leading into the nose. The nasal duct is about half an inch long, and as thick as a small crow-quill.

The *eyeball* is a slightly flattened globe with the broad side looking forwards (as if the head on a shilling and not the edge). The clear part or cornea is a section of a lesser globe, like half a pea on three quarters of a marble. The ball consists of three coats, and encloses three transparent optical materials, and is moved by six muscles, four straight and two oblique. The first coat, which is under the conjunctiva (the conjunctiva covers only the front part of the globe), is called the sclerotic, and forms the white of the eye, changing in front into a clear transparent material, the cornea, which forms the clear front of the eye. Inside the sclerotic is a dark brown coat, the choroid, mainly

composed of blood-vessels and colour-cells, and which ends near the cornea in a series of plaits or folds, the ciliary processes. The dark choroid absorbs the light which has passed through the retina, and prevents reflection, which would cause dazzling and confused sight. Animals which have no colour in this coat are dazzled by strong daylight. In some animals there is a fine fibrous structure (*tapetum lucidum*) which refracts light, and makes them see better in the dusk; this gives the green glow in the eyes of cats. Inside the choroid is the retina or membrane of vision, which is an expansion of the fibres of the optic nerve, and extends forward to the cornea. Exactly in the centre, and in the axis of vision, is a small yellow spot which is the most sensitive part of the eye, about a tenth of an inch to the inside of which is a round white spot, the entrance of the optic nerve and the only blind spot in the eye. The optical apparatus consists of four different lenses filling up the interior of the eye, and all of them under ordinary circumstances perfectly transparent. 1. The cornea (transparent part of the sclerotic), which is nearly circular, and forms about one-sixth part of the whole globe; it is composed of about sixty different layers, and is overlapped at the edge by the sclerotic, like a watch-glass by the case. It is so clear that one must look sideways through the eye of another person to see it properly. 2. The aqueous humour, which is a watery fluid filling the space between the cornea and the crystalline lens, and having the iris hanging in it. 3. The crystalline lens, one of the most remarkable bodies in nature. It is a biconvex lens, more curved behind than in front, composed of concentric layers like an onion, and enclosed in a delicate capsule. When freshly taken from an animal, its clearness can be compared only to a

large dew-drop. 4. The vitreous humour. It is a clear stiff jelly, enclosed in delicate transparent meshes, and fills up the great bulk of the eye.

In front of the crystalline lens, and hanging freely in the aqueous humour, is a curtain called the iris and perforated in the centre by a hole which is the pupil of the eye. The iris is about half an inch in diameter, and contains radiating muscular fibres in front, by the contraction of which the pupil is enlarged, while there is a band of circular muscular fibres behind, at the edge of the pupil, by contraction of which the pupil is diminished. The colour of the eye depends on the colour of this curtain (many-coloured iris), and its movements, varying the size of the pupil, regulate the supply of light to the eye. At the outer margin of the sclerotic and choroid, a small circular muscle lies between them, the ciliary muscle, by the contraction of which the shape of the crystalline lens is changed, and the eye accommodated for long or short sight. A full account of the action of the eye would be out of place in a work like this, requiring as it does a knowledge of optics, but may be had in the text-books of Physiology and Anatomy.

GROUP I.

AFFECTIONS OF THE CONJUNCTIVA.

Conjunctivitis: Ophthalmia.—The conjunctiva is the lining membrane of the eye and eyelids. Like all other mucous membranes, it is liable to become inflamed from various causes, constituting ophthalmia, which is named according to the cause or consequence. In all the varieties the most prominent symptom is redness of the membrane, generally of a bright scarlet colour, diffused or in patches. When the inflammation is severe, all the

eye except the clear part (cornea) may be a bright red, containing enlarged tortuous vessels; by dragging slightly with the finger the conjunctiva may be made to slide over the deeper sclerotic coat, carrying its enlarged red vessels with it.

Catarrhal Ophthalmia.—Is the most common of all eye diseases, and may be produced by exposure of the eye to cold, or without apparent cause. There is a feeling of grittiness, as if fine sand had got into the eye, with some stiffness of the lids, and after slight pain or a sense of scalding. The membrane (conjunctiva) becomes red, beginning at the outside of the ball, and fading as it approaches the clear part (cornea). As the affection advances, the white of the eye becomes a uniform bright red colour. There is increased secretion from the surfaces of the eye and lids, at first clear and viscid, but becoming thick and yellow. During sleep there is little discharge, so that in the morning there is dryness of the eye, and eyelids are sticky and gummed together by the dried secretion. There is often also swelling of the membrane on the eyeball (chemosis), sometimes so much as to make the cornea look sunken, and also swelling of the lids. The cornea is clear, and the pupil active on exposure to light, showing that the deep structures are not involved. Vision is generally impaired by motes of discharge, floating in the tears, and moved over the eye by the lids. Catarrhal ophthalmia usually attacks both eyes at once, or one may be affected a little before the other; it is seldom limited to one eye.

It yields readily to treatment, leaving no trace behind, but if no treatment or unsuitable remedies be used, the inflammation may extend to the cornea, and cause ulceration.

Treatment.—The patient should remain in a room of uniform temperature, and a purgative be taken,

such as 4 grains of calomel, at the commencement of the attack. The eye should be bathed every two hours in a lotion of alum, 4 grains to an ounce of distilled or rain water, and at each application a little should be allowed to run into the eye, by opening and shutting it several times. To prevent the eyelids sticking together during sleep, a little ointment, such as dilute nitrate of mercury ointment, one to seven of lard. When there is considerable inflammation, nitrate of silver, 2 grains to an ounce of distilled water, is a most useful lotion; one drop to be let into the eye twice a day, and the alum lotion used in the intervals.

The discharge may be frequently washed off with lukewarm water, and any lint or rags, used to wipe it off, should not be used a second time, but should be burnt.

Pustular or Strumous Ophthalmia.—Is the most common affection of the eyes in children, between the time of weaning and ten years of age. It is usually associated with scrofula, and, if neglected or mistreated, may cause permanently injured vision, or even loss of sight. One or both eyes may be affected from the first, but if both are affected, one is usually much worse than the other. There are one or more small grey pustules or pimples at the margin of the cornea or clear space of the eye, preceded and accompanied by a burning or stinging pain, watering of the eyes, and intense intolerance of light (photophobia), which is greater in this than in any other disease of the eye. The child, in severe cases, keeps its eyes fast closed and its face buried in the nurse's dress. On attempting to look at the eyes, there is violent spasmodic closure of the lids; and when, after severe struggles, the lids are separated, the eyeball is turned up so as to hide the pupil. The exposure of the eye to light often brings on a fit of rapid sneezing. The severity

of the symptoms is often quite disproportionate to the apparent disease, which may consist of merely one or two small pustules on the margin of the cornea. At first they appear as vesicles, the contents of which soon become turbid and burst, leaving small ulcers which heal, leaving no scar. In some cases the whole eye is bloodshot, in others there is only a scarcely perceptible tinge of colour, when opened; but it soon flushes on exposure to light.

Scrofulous ophthalmia is tedious in its progress, and very apt to recur. It may be brought on by impure air, improper food, and insufficient sunlight, and is generally associated with other signs of scrofula.

Treatment.—Is chiefly to improve the general health. During the acute stage with great intolerance of light, 10 drops of antimonial wine may be given every four hours; but if it fails to do decided good in three days, it should be discontinued.

If the lips and nostrils are red and swollen, with crusts round the nose, arsenic. Five drops of the potash solution (*liquor arsenicalis*), and iron 9 grains of the carbonate, should be given twice a day after food, but should not be given if there is a hot skin and furred tongue. If the sclerotic is also affected, which is shown by a pink zone of straight small vessels running from the cornea, one-sixteenth of a grain of bichloride of mercury in a tablespoonful of water twice a day should be given for adults, but in children under four, one grain of grey powder (mercury and chalk) should be given instead.

The food should be digestible and nourishing, with a considerable proportion of milk, and a tablespoonful of cod-liver oil daily. The child should wear a shade, and be as much in the open air as possible, while the treatment must be continued for a fortnight after the affection is subdued.

Of local applications, sulphate of atropine lotion,

1 grain to the ounce, should be dropped into the eyes four times daily. If there is much struggling the drops should be discontinued, and the eyes bathed with belladonna lotion instead, 5 grains of the extract to an ounce of distilled water. A piece of linen dipped in it may be laid over the eyes during sleep. The margins of the eyelids should be washed night and morning if they are gummed, and a little dilute nitrate of mercury ointment rubbed on them at bedtime.

If the heat and swelling persist along with pain, a leech to the temple, and a blister of the size of a penny behind the ear, may be needed.

There is another form of pustular ophthalmia in which the symptoms are very mild: there are one to four pustules of a reddish colour at the base, and yellowish white at the top near the margin of the cornea. They do not contain pus, but merely a little watery fluid, and the conjunctiva round them is more or less reddened. There is no intolerance of light and seldom more than a slight feeling of grittiness as of sand in the eye: this form is very apt to recur.

Treatment.—Attend to the general health and dust a little calomel on the pustules with a camel-hair brush every second day.

Purulent Ophthalmia (Contagious Ophthalmia).—Commences with a slight discharge from the eye and swelling of the lids, together with a sudden feeling of sand in the eye, and sticking of the lids. The discharge rapidly increases in quantity and in six to twelve hours changes to pus, the conjunctiva on the eyeball becomes swollen and rises above the cornea in a red ring (chemosis).

The lids become red, shining, and swollen with fluid. If the disease progresses unchecked, the cornea becomes cloudy and may be flesh-like in appearance and then ulcerates, or a part dies and

the eye is destroyed by the perforation, which is shown by a copious discharge of hot fluid, giving temporary relief to the pain. Sometimes the deep structures of the eye are affected, causing severe pain in the eyeball aggravated at night and declining towards morning.

The disease usually begins in both eyes at once, and may result in: (1) Destruction of the eye from ulceration or sloughing; (2) the eye may recover with a white opaque spot on the cornea, to which the iris may adhere, causing a distorted pupil; (3) it may leave granular lids.

This form of ophthalmia is always present in Egypt, where it often occurs in epidemics apart from infection. It is also apt to be epidemic in work-houses and schools, probably from contagion. The discharge may amount to several ounces in twenty-four hours, and is violently contagious, the smallest trace of it touching a sound eye setting up the same disease in it.

Treatment.—In mild cases the same as catarrhal ophthalmia. In severe cases the bowels should be opened by 3 grains of calomel and 15 grains of compound jalap powder; 2 grains of quinine should be taken every four hours. If there is much pain, 25 drops of laudanum may be given at bedtime.

The food must be nourishing: animal food, milk, beef-tea and wine, one glass of sherry along with dinner. If there is much weakness, a tablespoonful of cod-liver oil every day. Alum lotion, 6 grains to an ounce of distilled water or sulphate of zinc 4 grains to the ounce should be used at least every hour to wash away the discharge, which is best done by a small gentle stream from a syringe or india-rubber ball, and the same lotion must not be used again. Any thick discharge must be wiped off by a piece of lint or rag, which should immediately be burnt. Two drops of a

solution of nitrate of silver, 3 grains to an ounce of distilled water, should be dropped *into* the eye twice a day. A fold of linen dipped in iced water and laid over the eye during the intervals between using the lotion is very soothing to the patient; it should be changed as often as it gets hot or dry.

Gonorrhœal Ophthalmia is a violent specific form of purulent ophthalmia, which begins in one eye from contact of infective matter, and usually soon affects the other. The eye may be destroyed in a few hours in the worst cases. Treatment the same as severe purulent ophthalmia. When one eye only is affected the other should be covered with a bandage to prevent its infection.

Purulent Ophthalmia of Infants (Op. neonatorum), when neglected or improperly treated, is a most disastrous disease, often causing total blindness. It usually commences from the second to the seventh day after birth, most frequently on the third day, and may be caused by contact with discharges during birth, or milder forms from soap or gin, etc., getting into the eyes. On the morning of the third day after birth the upper eyelid is somewhat swollen, the edge red, and the eyelashes glued together with a slight discharge from the eye. In a few days, often in a few hours, the discharge becomes thick and purulent—in slight cases, of a whitish colour and not very abundant; in severe cases, deep yellow, and very profuse. The child becomes feeble, restless and fretful, with its eyes constantly shut. In this state the child may remain for eight or nine days, when, if not relieved, the cornea becomes cloudy and ulcerates, causing destruction of the eye.

Treatment.—Alum lotion, 6 grains to the ounce, to wash away the discharge every half-hour during the day and every hour at night; nitrate of silver

solution, 3 grains to the ounce, one drop placed in the eye three times a day.

The easiest way to apply the lotion is to place the child on the nurse's lap, turn its head on one side, separate the lids with the thumb and finger of the left hand—being careful, as in all diseases of the eye, to rest the hand and fingers on the surrounding bone and not to press unnecessarily on the eyeball—and gently squirt a stream of lotion from the syringe into the eye on the side next the nose, allowing it to run away between the lids on to a soft napkin placed below the head.

Granular Lids.—Is a frequent result of purulent ophthalmia. The outside of the eye may appear quite healthy, but the patient complains of impaired vision, the sight is misty, and rainbow colours often appear round the flame of a lamp or candle. On turning out the eyelid the inner lining is seen to have lost its bright polish and smoothness, and has become rough from numerous small projections, which may be bright red, dull red, yellowish, pale grey, bleeding, or like grains of boiled sago. The cornea, in course of time, from the friction of the roughened lids, becomes cloudy, uneven, and with red vessels running into it, so that for all useful purposes the eye is practically blind.

Treatment.—Turn out the eyelids, and dust finely powdered acetate of lead over them; repeat this three times, at intervals of four days. If this does not suffice after three weeks, turn out the eyelids and dab them with a piece of linen soaked in liquor potassæ, repeating it every four days till it has been done four times. Touching the granulations only, with nitrate of silver or sulphate of copper, is used by eye-surgeons, but if improperly done it causes more harm than good.

GROUP II.

AFFECTIONS OF THE CORNEA, IRIS, AND
CRYSTALLINE LENS.

Inflammation of the Cornea (Corneitis, Keratitis).—Usually begins with a slight pink ring round the cornea or a few patches only; the eye is irritable, and shuns the light; the cornea begins to look heavy, and the sight is dimmed. There is generally a flow of tears and pain in and around the eye. The morbid action may remain for months and leave the cornea permanently cloudy, or the disease may go on to ulceration. When recovery begins, red vessels run into the cornea, till in some cases it looks like a piece of red velvet (pannus). Gradually this clears, and transparency is restored.

The causes are ill-health generally, scrofula, or syphilis.

The inflammation may cause pus in the layers of the cornea, either spread all over, or in a small abscess, and may open inwards into the eye or outwards.

Treatment.—Attend to the health generally with the treatment of the cause. Protect the eye from light by a double shade and drawn blinds. Apply a hot fomentation of extract of belladonna, 3 grains to the ounce of distilled water, to the eye, or cold water if more agreeable to the patient, and lay a piece of lint dipped in belladonna lotion, 3 grains to the ounce, over the eye. Apply a blister, the size of a shilling, behind the ear, and at the outset half a drachm of compound rhubarb powder may be given.

Ulcers of the Cornea.—May occur at all ages, in people weakened by illness, insufficient food, scrofula, or from other diseases of the eye. They are always accompanied with pain and a

feeling of sand in the eye, dread of light and flow of tears. When the ulcer is confined to the surface of the cornea (epithelium), after healing, the eye regains perfect transparency, but if the deeper parts of the cornea are involved, it leaves a white scar which never disappears. Superficial ulcers appear like a very slight scratch dimming the bright surface of the cornea. One form of deep ulcer sometimes runs round the outside of the cornea like a ring. If an ulcer perforates the cornea, the sight is lost, the aqueous humour flowing out, and with it the free edge of the iris.

Treatment.—Is the same as inflammation. Good diet, seclusion from light, cold or hot fomentations, whichever is more agreeable, and belladonna lotion, 3 grains to the ounce.

Foreign Bodies in the Eye.—Grains of sand or dust, or particles of metal, are sometimes blown or projected into the eye, causing a copious flow of tears and inability to raise the upper eyelid or to face the light.

Treatment.—The cornea should be well looked over with an ordinary lens or magnifying glass, a very small particle stuck in the cornea sometimes giving rise to severe irritation. A broad needle should be run beside the particle, but not through the cornea, and with another needle it may be picked out. Failing to find a body on the cornea, the eyelids should be examined, the lower one by drawing it down and the upper one by turning out the inner surface over a knitting-needle, crow-quill, or the like. Having removed the foreign body, 2 drops of olive oil should be dropped into the eye, which should not be used for two or three days. If there is much pain, the eyes must be fomented with belladonna lotion, three grains to the ounce.

When hot fluids, or strong acids, or, most destructive of all, unslacked lime, get into the eye, it

should be at once bathed with cold water, and 2 drops of olive oil placed in the eye.

Inflammation of the Iris (Iritis).—Inflammation of the iris may be a primary disease or it may be due to inflammation of one of the coats of the eye. The inflammation generally appears to begin at the free margin of the iris, and from thence spreads till it may affect other structures. There is a strong tendency to recurrence of the attack; an eye that has once suffered is always more liable to an attack in future, especially in the rheumatic form. The chief symptoms of iritis are—first, a delicate pink ring round the cornea, the colour of which is brightest at the edge and fades away towards the white of the eye; this colour is due to a number of fine straight hair-like vessels running in towards the edge of the cornea, and is constant while the inflammation of the iris lasts, disappearing when it ceases. The transparent conjunctiva can be freely moved over it. If the conjunctiva is inflamed, its colour is bright scarlet, containing large tortuous vessels.

2. A peculiar discoloration of the iris, which has a dull and glistening appearance; if naturally blue or grey, it becomes of a dirty greenish or slate colour; if naturally dark-coloured, it becomes of a brownish red. The inflamed eye should be compared with the sound one.

3. The pupil is contracted and irregular in shape, and is immovable, or moves very sluggishly when exposed to light.

4. The iris may adhere in one or more places to the lens or cornea.

5. Dimness of sight varying from a slight mist to total blindness.

6. Pain in the eye, which may be slight or begin early and gradually become very severe. Pain round the eye at night.

7. Fever and headache, with white tongue and disturbed sleep.

All the above symptoms are not always or even often present, especially pain and fever, which may never be present. The chief causes are exposure to cold and wet, rheumatism, syphilis, scrofula, gout, and injuries.

Treatment.—Rest in a darkened room. The pupil to be kept dilated by two drops of a solution of atropine, 2 grains to the ounce of distilled water, dropped into the eye every hour. A fold of linen wetted with solution of extract of belladonna, 5 grains to the ounce. After the first two days the drops to be used four times a day for a fortnight or three weeks. The bowels to be kept regular by 4 grains of calomel, when required. If the cause is rheumatism or scrofula, 3 grains of iodide of potassium every day together with 2 grains of quinine. Opiate, 25 drops of laudanum, may be required at night if the pain is severe. The food must be plain, nourishing, and free from stimulants.

Cataract.—Is an opacity of the crystalline lens or its capsule or of both. It may occur from old age, constitutional disease, disease of the deeper parts of the eye, or injuries. There are two kinds, forming several varieties: soft cataract, in which the lens is soft and cloudy, which may come on at any time from infancy to thirty-five years of age, or may exist at birth; and hard cataract, in which the lens becomes firm and dark-coloured, usually beginning at the centre, and which may come on any time after thirty-five years of age. Either kind may begin at the edge of the lens or in the centre, and one eye is usually affected before the other. The sight becomes obscured by a thick cloud, and goes on till vision is reduced to a mere perception of light from darkness. The time taken to arrive

at this stage is very variable, often many years. If the inside of the eye be sound, vision may be restored by an operation to remove the opaque lens. convex cataract glasses being used afterwards to perform its function.

GROUP III.

CHANGES IN THE SHAPE AND POWER OF THE EYE AND FUNCTIONAL DISEASES.

THE eye is naturally set to see things at a distance. When we look at things close at hand we unconsciously focus the eye, but not in the same way that a telescope is focussed. We focus the eye by contraction of the ciliary muscle round the edge of the lens, which compresses the lens and makes it more convex (curved) in front, thus shortening its focus. Short sight may be caused by a permanent state of contraction and increased curvature of the lens, but more commonly it is caused by the eye being or becoming too long from before backwards, like a telescope out of focus by being pulled out too far. Long sight is due to loss of the power of focussing (accommodation): the eye always remaining in its natural condition, focussed for far sight. To see the deeper structures of the eye requires an ophthalmoscope and training, and their diseases are therefore omitted.

Short-sightedness: Myopia.—When the farthest distance at which ordinary type can be easily read is less than twelve inches, vision is short-sighted. Things close at hand can usually be seen well, but objects at a distance are dim, confused, and may be surrounded by circles of colours. Exposure to a bright light generally makes the sight worse. Short sight may be hereditary, may exist from birth, or may be acquired by those who work

a long time at fine work, such as watchmakers, and those who read or study much.

Treatment.—Use concave glasses, as weak—that is, of as long focus—as will suffice to read with ; and if there is much short-sightedness, a stronger glass for outdoor use. The weaker glasses may be spectacles, with a stronger double eye-glass to be held in front of the spectacles for occasional distant vision. All stooping positions of the head must be avoided ; while reading, the head should be thrown back, and the book brought to the eyes, not the eyes to the book. Avoid reading by gas-light, especially flickering light ; the best artificial light is a lamp with a shade throwing the light on the work, and leaving the rest of the room darkened. Avoid reading in a carriage, the jolting of which displaces the words, and tires out the eye by repeated focussing ; for the same reason, books printed in very short lines must be avoided. If the eyes grow tired, rest them, and do not begin work again till they are refreshed. When they are tired, or hot and irritable, bathe them with the lids shut, in cold water.

Long Sight.—The usual form (*presbyopia*) is due to a failure of the focussing power of the eye, from weakness of the ciliary muscle, and is one of the first signs of advancing age, the muscles of the eye participating in the general degeneration of the whole system. The person affected notices that in order to read he has to hold a book farther off than he used to do, though distant vision is unaffected. The failure of near sight is most noticed in the evening, the patient seeking a strong light to contract the pupil and render the vision clearer, by cutting off the outside rays in the same way that a diaphragm is used between the lenses, in a telescope.

Treatment.—*Convex* glasses strong enough—that

is, of short enough focus—to allow him to read easily at twelve inches from the eye, and a stronger glass for use in the evening.

Another form of long sight (*hypermetropia*) is due to the eye being too short from before backwards, or to changes in the lenses which the focussing power is only partially able to correct. This form of long sight may be either original or acquired, and is the reverse condition to short sight, the other form of long sight being merely failing power of one part of the eye. The sight for distant objects also may be confused in some cases. In order to see near objects as in reading, the eyes are turned slightly inwards and strongly focussed.

Treatment.—Is the same as for the other form of long sight, but after a time stronger glasses will be needed, from the eye relaxing from its state of permanent focus for short distance, by which it endeavoured to compensate the defect. This relaxation may be produced at once by 2 drops of solution of atropine, 4 grains to the ounce, and the strength of glass which will be ultimately needed ascertained.

Weak Sight.—May be due to the second form of long sight (*hypermetropia*). So long as the focussing power is sufficient to overcome the defect, the sight is good, but the strain causes fatigue, and the focussing power relaxes when the sight becomes dim and confused or disappears; after a few minutes' rest the sight returns, but if the work and strain on the eye continue, it soon disappears again. Another form of weak sight is due to fatigue of the muscle (*rectus internus*) which turns the eye inwards. After a short time, when reading, the letters become confused and the lines seem to overlap or run into one another.

Treatment.—For the first form, proper glasses, as in long sight. The second form may require an operation to remedy it.

Astigmatism.—All eyes are slightly more curved in one direction than in another, and when this is excessive, either from birth or caused by injuries or ulcerations, acuteness of vision is lost, each eye having two or more foci, one for each different curvature. If some thick lines be placed upright on a wall, and some more across beneath them, on walking slowly towards the lines, one group will be seen distinctly some distance before the other group appears clear and distinct, owing to the different diameters of the eye having different focuses, from their different curvatures.

Treatment.—Cylindrical glasses of some kind, according to the character of the astigmatism.

Squinting.—When vision is sound and equal in both eyes, squinting may be cured by a minor operation.

Night Blindness.—Varies from dimness of vision to almost complete darkness after the sun goes down. It is most frequent in the tropics, and is caused by exposure of the eyes to a glare of light, in those who are weakly, especially from scurvy or malarious fevers.

Treatment.—A plentiful supply of oranges, and 4 grains of quinine daily, with the use of dark neutral-tint glasses.

Colour-blindness.—Is quite consistent with perfect vision in other respects, and is usually present from birth, but occasionally it may be produced by disease or injury. There are three varieties:—

1. Where no colour is perceived, beyond black, grey, and white, everything appearing like an engraving, merely distinguished by the light and shade.

2. Inability to distinguish shades of colour.

3. The most common form is that in which the sensation of red is wanting.

The first form, or absence of all colour sensation, is rare, and is usually produced by disease.

The second form, inability to distinguish shades, may be acquired from over-use of the eyes in looking at colours, by colour sorters.

In the third form, Professor Maxwell has shown that the colour they do not perceive is that of the lower end of the spectrum, red; they see blue and yellow, with their combinations, but they see red and sea-green as grey, scarlet and green as yellow, rose colour and blue-green as blue, while the different shades of red, and also of green, can be distinguished from each other. If such a person looks at a red and green material, through a red glass, the green appears darker, but the red is nearly as bright as before; if he uses a green glass, the red is darker and the green little altered. If a colour-blind person had the courage to wear a pair of spectacles with one glass red and the other green, he would probably in time come to distinguish red from green things at once. He would never acquire the sensation of red colour, but he could distinguish them as well as if one was marked R, and the other G.

Colour-blind people often do not know of the defect in their vision till their attention is attracted by two colours, which appear alike to them, being said by others to be different colours. This defect of vision is often hereditary, and may affect all the members of a family. Arago, the famous astronomer, mentions the case of a family, all of whom were colour-blind. "For these unhappy beings, cherries never were ripe"; at least, they had always to taste them before they could tell.

GROUP IV.

DISEASES OF THE EYELIDS.

Inflammation of the Edge of the Lids (Tinea Tarsi).—Is a chronic disease of the follicles of the eyelashes which is difficult to cure and very apt to return. At first the margins of the lids are red and irritable; there is excessive secretion from the follicles of the eyelashes, which accumulates during the night and causes the lids to be gummed together in the morning. As the disease progresses the discharge becomes thick and purulent and forms scales which adhere to the margins of the lids and to the eyelashes. Small pustules form at the roots of the lashes, and burst, leaving small ulcerations covered by yellow crusts, the eyelashes gradually fall out and the edge of the lid becomes thickened, rounded, and turned outwards, causing a slight but constant overflow of tears in extreme cases. There is also considerable itching of the lids. This affection is most common among the poor and after acute fever, when the general health is lowered.

Treatment.—Constant cleanliness. The lids must be bathed with warm water night and morning, and scales removed. At bedtime the edge of the eyelids should be smeared with dilute nitrate of mercury ointment, one part of ointment to seven of lard, and the lids washed in the morning with cold tea (no sugar, milk, or leaves), which may be repeated every three hours during the day. When the eyelashes are very long, they should be cut short. In severe cases the edges of the lids may be touched in the morning with nitrate of silver solution, 5 grains to the ounce, applied with a camel-hair brush. The general health must be attended to, milk diet, a tablespoonful of cod-liver oil, and 4 grains reduced iron twice a day.

Sty.—Is a small boil near the edge of the eyelid, generally connected with one or more eyelashes. A succession of them is a sign of ill-health.

Treatment.—Hot fomentations and a poultice at night covered with a piece of oiled silk. The bowels may require to be opened and tonics taken. Thirty grains compound rhubarb powder as a purgative, and iron, 10 drops of the tincture; quinine, 2 grains, with a tablespoonful of infusion of quassia twice a day after meals, as a tonic in cases where there is a succession of sties.

Inverted Eyelashes.—The eyelashes may be irregular, affecting a few lashes or the whole row, or there may be a distinct double row on the lid, the inner row turned inwards sometimes so completely that they cannot be seen till the lid is turned out. By the friction against the eyeball they cause severe irritation and may render the cornea cloudy with red vessels running into it.

Treatment.—Carefully pick out the eyelashes which are turned inwards with a pair of tweezers. In severe cases an operation on the lid is required.

Turning out of the edge of the eyelid, usually the result of an injury, and turning in of the edge, which may be spasmodic or a result of ophthalmia, require an operation on the lids to remedy them.

Bruises.—Commonly called a black eye. The swelling is usually due to effusion of blood and serum (the thin part of the blood) into the lax tissues from vessels ruptured by the blow. When the skin around the eye and the eyelids is puffed up with air (rare), some of the bone-cells (ethmoidal or frontal) are broken; the patient should not blow his nose for a week. Cold water should be applied to the bruised eye at once, and a cold lotion of half a drachm tincture of arnica to an ounce of water used to wet a linen cloth laid over the eye and re-dipped from time to time.

CHAPTER III.

AFFECTIONS OF THE EAR.

THE ear has three parts—the external ear, middle ear (tympanum), and internal ear (labyrinth). The *external ear* includes the expanded part (concha) and a canal (meatus) about an inch and a quarter long, slightly narrower in the middle, and bounded internally by a thin membrane, the ear-drum (membrana tympani). The *middle ear* (tympanum) is an irregular cavity filled with air and crossed by a chain of three small bones, one end of which is attached to the drum, while the other is attached to a membrane (fenestra ovalis) forming part of the wall of the inner ear. The cavity communicates with the back of the throat by a small duct (Eustachian canal). The *inner ear* is a small and very complicated arrangement filled with fluid. It consists of three semicircular canals, which perceive the strength of sounds, and a spiral, like a snail shell, which perceives the quality of sounds. In the spiral are great numbers of fibres (rods of Corti), somewhat like the keys of a piano, each of which probably, like a tuning-fork, answers only to its own note.

Ear-ache.—May be due to neuralgia, caused by a decaying tooth, or to inflammation spreading up from the throat along the Eustachian tube, or to inflammation, or foreign bodies in the external ear.

The pain may be very severe, sharp and piercing, darting out towards the ear or shooting from the ear over that side of the head and neck.

Treatment.—Syringe out the ear with warm soap and water, and then put in a plug of cotton soaked in equal parts (ten drops) of laudanum and glycerine; apply a blister the size of a shilling behind the affected ear, and steam the throat by inhalation; keep a bag filled with hot bran, salt, or sand to the ear.

Inflammation of the External Ear and Drum.—May be caused by cold, accumulation of hard wax, blows on the side of the head, irritating matters introduced into the ear, gout, etc.

The symptoms are dull aching pain, which is increased on moving the jaw, diminished power of hearing, and sometimes temporary deafness from swelling of the membrane. The glands of the neck on the affected side become swollen, there is itching of the ear and general depression and irritability. After two or three days a watery fluid begins to flow from the ear. The inflammation may cause permanent diminution of hearing by thickening or relaxing the drum of the ear. Occasionally there is ulceration which perforates the drum, causing total deafness of that ear.

Treatment.—Improve the general health. Milk diet, quinine, iron, cod-liver oil.

Hot fomentations and poultices to the ear, very gently syringing three times a day with warm water, in the interval one drop each of olive oil and laudanum with half a grain of acetate of lead.

Inflammation of the Middle and Inner Ear.—May be due to rheumatism, gout, scarlet fever, measles, or cold and serofulous constitution. There is uneasiness in the ear which is increased on blowing the nose or swallowing, and which gradually becomes a severe continuous pain, with loud noises in the ear, but deafness to external sounds. There may be severe headache, flushed face and eyes, sharp pains and a sense of bursting in the ear, anxious face, great depression, fever and delirium; sometimes there is

facial paralysis. The inflammation may subside or form pus, which bursts through the drum of the ear, giving instant relief, the opening in which usually soon heals, or the inflammation may spread into the cells of the bone.

Treatment.—Hot fomentations and poultices, inhalation of steam, a blister behind the ear of the size of a shilling, half an ounce of cream of tartar every second day. If there is gout or rheumatism, its appropriate treatment (pp. 105 and 108).

Running from the Ear (Suppuration of the Ear).—May be caused in children by teething, in adults by cold, growths, fevers, especially scarlet fever and measles. The secretion is generally offensive and irritating, and may be tinged with blood. Usually the discharge stops in a short time, but it may become chronic and destroy the drum and small bones of the ear, and not unfrequently destroys a part of one of the bones of the skull (petrous of temporal), leading to inflammation or abscess of the brain. There may be no symptoms beyond slight deafness.

Treatment.—Frequent syringing with warm water and Condyl's Fluid 1 in 20, say every two hours. At night cotton soaked in equal parts of olive oil, laudanum, and acetate of lead solution.

Bleeding from the Ear.—When it follows blows on the head it shows fracture of the base of the skull, and is a bad sign. It may also be caused by wounds, foreign bodies, growths and death of bone; other causes are suppression of long-standing discharge, such as from an ulcer or piles, and sudden rupture of the drum of the ear by violent coughing or sneezing.

Treatment.—When the bleeding is from rupture of the drum, insert a plug of cotton steeped in equal parts of perchloride of iron and glycerine. Growths and obstinate deafness may be relieved by a good surgeon.

CHAPTER IV.

DISEASES OF THE CIRCULATORY SYSTEM.

THE heart is divided into four compartments, two collecting chambers or auricles, and two pumping chambers or ventricles. On the right side, the right auricle collects the impure blood of the body from the great veins, and before every beat of the heart passes its blood into the right ventricle. At every beat of the heart, the right ventricle forces the blood in it into the vessels of the lungs, where the blood is purified, giving out chiefly carbonic acid gas and water. The veins from the lungs convey the purified blood to the left auricle, whence it is passed into the left ventricle, which at every stroke forces it into the great artery of the body to supply the system, from which it is returned by the veins to undergo the same round; thus the right side of the heart receives the impure blood from the body and forces it through the lungs, while the left side of the heart receives the purified blood from the lungs and forces it through the body. The orifices of the arteries to the lungs, and to the body, and the passage between the auricles and the ventricles, are guarded by valves to prevent the blood flowing back from the arteries, when the pressure of the ventricles ceases, and from the ventricles during the stroke. The valves may be compared to folding doors which open only one way; they easily open forwards to the pressure of the blood, but slam together when

the blood tries to flow back. In the left half of the heart, which has most work to do and is thickest in consequence, the valve is in two pieces and is termed the mitral. In the right half of the heart it is in three pieces, and is termed tricuspid. The valve of the great artery of the body is also in three pieces, and is termed aortic valve. The whole heart is enclosed in a fibrous bag, termed the pericardium, and is lined inside the chambers by a smooth inner lining, the endocardium.

The position of the various parts of the heart on the chest is as follows. The apex or point is between the fifth and sixth ribs, about an inch to the inside of the nipple. The valve of the right side of the heart (tricuspid) lies behind the centre of the breast-bone, where it joins the fourth rib. The valve of the left side (mitral) lies behind the point of junction of the breast-bone and the fourth rib. The valve of the great artery of the body (aortic) lies behind the breast-bone, where it joins the third rib. The valve of the artery to the lungs lies close to the breast-bone, but not behind it, between the second and third ribs to the left side.

"There are few complaints which more surely tend to shorten life, and none give rise to greater suffering and discomfort, than diseases of the heart, pericardium, and great vessels. Alike in young and old they are the chief causes of sudden death, and if not suddenly fatal, they lay their own hard conditions on the continuance of a man's life, and almost settle beforehand the manner of his death."

The general symptoms which show disease of the heart are palpitation, sinking, and fainting, sometimes along with difficult breathing, cough, pain, and tenderness. The breathing is panting or gasping, and oppression rather than tightness is complained of, with a strangling choking feeling at the throat; it is made worse by movement, or

ly lying down, so that in severe cases the patient does not lie down for days, and should he sleep, he is at once awakened by a sense of suffocation, and has to struggle for breath.

In many cases there is no breathlessness when at rest, but it comes on with any sudden exertion, such as going up stairs. The diseases of the heart may be organic, when there is a change of structure, or functional, when there may be no change. The organic diseases require training and an educated ear to distinguish them, and therefore they will be merely mentioned. It must not be supposed that all kinds of heart disease are rapidly fatal. Some may give a long life, and insurance companies now take careful people on paying something extra.

GROUP I.

AFFECTIONS OF THE HEART.

Inflammation of the Pericardium (Pericarditis).—Is usually due to rheumatic fever, kidney disease, or scarlet fever. If there is fluid poured out between the membrane and the heart, there is difficult breathing and anxiety, the patient lying on his back and unwilling to move, the pulse is quick, and there is pain and tenderness on pressure; if there is no fluid, pain is increased also by movement and breathing.

Treatment (which is also that for endocarditis).—Hot fomentations, one grain of opium every four hours. When it has become chronic, occasional blisters.

Endocarditis.—Causes discomfort and uneasiness at the heart, with various murmurs, and results from the same causes as pericarditis.

Inflammation of the Heart and Fatty Heart.—Are often undistinguishable during life even by a skilled physician.

Disease of the Valves.—May be caused by endocarditis or by atheroma, which is a kind of fatty degeneration; also from thickening and fibroid growths on the valves. The effect is either to narrow the passage for the blood (obstruction) or to prevent the edges of the valve segments meeting, thus allowing the blood to flow back (regurgitation). Obstruction and regurgitation of the aortic valve are compensated by enlargement of the left ventricle; regurgitation gives a peculiar pulse as if balls of blood were shot along the artery. Obstruction and regurgitation of the valve (mitral) of the left heart prevent the blood passing quickly from the lungs by blocking the stream, and cause congestion of the lungs with severe cough, breathlessness, asthma, and palpitations. When any form has existed some time it is apt to cause dropsy, beginning in the feet and lower eyelids.

Treatment.—Nourishing diet, a small quantity of fluids and iron tonics. 2 grains reduced iron twice a day. If there is distress, digitalis 20 drops of the tincture and 10 grains acetate of potash twice a day. Quietness of mind and body.

Hypertrophy.—Hypertrophy, or increased bulk of the heart, is a compensating growth to overcome some obstacle to the blood. The heart has a heaving motion and knocks against the ribs.

Breast-pang: Angina Pectoris.—Occurs generally after middle life, and is more common in men than women. It is of the nature of a neuralgia or spasm of a weak heart. The paroxysm occurs suddenly with intense pain about the heart, which may extend to the left shoulder, and even to the elbow or hand, often with a feeling of numbness. There is a feeling of suffocation and a dreadful sense of impending death. The pulse is slow and feeble, the breathing short and hurried, the face pale and anxious, the surface of the body cold and

covered with sweat. The seizure rarely lasts more than one or two minutes, and when it passes off, the patient often appears quite well.

During an attack, if the patient is walking he is obliged to stop, but consciousness is unimpaired. The patient does not die during the first attack, he generally dies of some subsequent one. The intervals between the attacks vary from a few hours to months.

Active exercise, such as ascending a stair quickly, or strong mental emotions, a frightful dream, or considerable flatulence, are all exciting causes; each repetition of an attack increases its tendency to return and also increases its violence.

Treatment.—During the attack, inhale nitrite of amyl, 2 to 5 drops at a time, 2 teaspoonsful of brandy; a hot foot-bath. If the attack is prolonged, a compound colocyath pill, and a mustard poultice for ten minutes to the belly, along with 10 drops of ethereal solution of chloroform every five minutes.

During the interval nourishing food and tonics, such as carbonate of iron and quinine, twice a day along with iodide of potassium, 3 grains once a day. As in all diseases of the heart, quietness of body and mind is most important.

The patient should carry with him, loose in his pocket, some capsules of nitrite of amyl and ethereal chloroform, to be used when the attack comes on. Crush a capsule of nitrite of amyl in a handkerchief and inhale the vapour.

Palpitation.—Means inordinate action of the heart, and may be produced from many causes. Temporarily by any sudden or violent emotion, such as fright, joy, or anxiety; but unless continuous or very frequent, such an effect is not called palpitation. The more common causes of palpitation are from disease of the heart, from indigestion, or from

the nervous system by abuse of strong tea, tobacco, spirituous liquors, intense study, want of sleep, or sedentary habits, and also from changes in the blood, as in gout, jaundice, Bright's disease, or bloodlessness (anæmia).

The attack of palpitation may be sudden or only at night, or it may be preceded by acidity, flatulence, or some other affection of the stomach.

Treatment.—During the attack let the patient lie flat on his back, with the neck and chest bare, allowing the air to blow freely over it; and take 2 ounces of camphor water, along with 30 drops of ether, which may be repeated every half-hour till the attack subsides. Afterwards pay attention to the food and general health, avoid tea and coffee, and take cold water or boiled milk instead, moderate exercise in the open air, avoid tight clothing, use a cold shower-bath if it can be borne; and if there is bloodlessness take 8 grains of carbonate of iron twice a day along with 2 table-spoonsful of infusion of calumba. If the pulse is irregular, digitalis 20 drops of the tincture and 10 grains acetate of potash twice a day.

Prominent Characters of Palpitation.

FROM ORGANIC DISEASE OF THE HEART.

1. More common in men than women.
2. Palpitation usually comes on slowly and gradually.
3. Palpitation constant, though more marked at one time than at another.
4. Heart-beat stronger than natural, heaving and prolonged, or irregular and unequal.
5. Lips and cheeks often livid, face congested, dropsy common.
6. Palpitation increased by exercise, stimulants, tonics, etc. Relieved by rest, bleeding, and low diet.

INDEPENDENT OF DISEASE OF THE HEART.

1. More common in women than in men.
2. Usually sets in suddenly.
3. Palpitation is not constant, having intermissions.
4. Heart-beat neither heaving nor prolonged, often abrupt knocking and with a fluttering sensation.
5. Lips and cheeks never livid, face often chlorotic (white or greenish), dropsy absent.
6. Palpitation increased by sedentary habits, bleeding and low diet. Relieved by moderate exercise, stimulants, or particularly preparations of iron.¹

GROUP II.

DISEASES OF THE BLOOD-VESSELS.

Atheroma.—Arteries are composed of thin layers of an outer fibrous coat, a middle muscular and elastic coat, and an inner brittle coat. They are subject to a chronic affection called atheroma, which begins in the deeper layers of the inner coat, as a soft, transparent jelly occurring in little flat patches, and which degenerates into a material like pea brose, and finally, eats through the lining membrane of the artery, forming an atheromatous ulcer. Lime salts are also deposited in the inner coat extending from the deeper layers to the inside free surface, forming scales in the large arteries and solid tubes in the smaller arteries. The result of these changes is that the small arteries are narrowed or blocked up by the new material, while the large arteries are increased in size from their elasticity being destroyed. The current of blood is slowed by the rough surface of the lining membrane, the want of elasticity, and the narrowing of small arteries, and may form clots which may

¹ Aitken.

block up the vessel. The scales formed of the lime salts, or clots formed, may be washed away in the current of blood and block up smaller distant arteries, causing apoplexy if in the brain, and death of the part supplied with blood from that artery. This is the most common cause of gangrene (mortification) of the toes in aged people. The arteries at the wrist and on the temple may be seen and felt to be hard and tortuous in many elderly people, which is caused by atheroma, and also a white ring round the clear space or cornea of the eye (arcus senilis).

There are no special symptoms, and the treatment is limited to nourishing food and avoidance of sudden excitement or exertion. The parts already injured cannot be restored, but the disease is not incompatible with a long life.

Aneurism.—Is a swelling on an artery forming a pulsating tumour, and may occur when an artery is weakened by thinning of its walls or by atheroma. It is commonly formed of the inner and outer coats of the artery dilated in one spot into a bag which slowly increases, the inner coat disappearing, and which converts any organ it touches into a part of the sac till it reaches a free surface such as the skin or bowels, when it bursts and causes death from bleeding. Where an aneurism, however small, projects into a mucous canal, such as any of the ducts or air passages of the body, it softens and ruptures. Aneurism of part of the great artery (aorta) may cause cough, extreme breathlessness, or asthma, croaking voice, and difficulty of swallowing, from pressing on a branch of the nerve to the lungs (recurrent laryngeal).

Treatment.—The object of the treatment is to slow the current of blood, so that the sac of the aneurism may become filled up with a clot, which thus obliterates the aneurism and causes a perma-

nent cure. Aneurisms of the limbs and branches of the main artery may generally be cured by a surgical operation, provided the arteries generally are healthy. The medical treatment of aneurisms inaccessible to the surgeon consists of strict rest, lying down in a cheerful airy room. On no account must the patient stand or even sit up.

Low diet; all excitement to be avoided, and tincture of aconite, 10 drops, with acetate of potash, 5 grains, three times a day, and iodide of potassium, 4 grains, twice a day. The pain may require to be soothed by opiates. Avoid hot fomentations or blisters to the swelling of the aneurism.

Inflammation of Veins (Phlebitis).—Is of two kinds, or rather the effects are of two kinds. 1. Adhesive, where a clot is formed which may fill the vein and cause its obliteration, leaving the part affected as a fibrous cord, or it may be dislodged and be carried in the blood through the heart to the lungs, where it blocks up some vessel, causing sudden breathlessness and other symptoms of apoplexy of the lungs. 2. Suppurative, in which it forms pus or absorbs it from some sore, and the particles being small enough to pass through the lungs are caught in distant organs; and when the pus is infective it sets up an abscess wherever it is caught: hence the multiple abscesses in pyæmia which occur in the lungs, limbs, and body generally. Bed-sores are not an unfrequent cause of clots in the veins.

Symptoms.—There is pain, increased on pressure, swelling, stiffness and redness over the affected vessels, and generally spreading upwards towards the heart. When suppuration occurs there are flying pains in various parts of the body, generally accompanied by fever.

Treatment.—Perfect rest, hot poultices, milk,

eggs, 6 tablespoonsful of sherry daily with 4 grains of quinine.

White Leg: Milk Leg.—Is a painful brawny swelling of one or both lower limbs, and is most common in women within six weeks after confinement, especially when much blood has been lost. The symptoms are due to obstruction of the veins and lymphatics by a clot. The disease may begin with a chill or shivering, succeeded by fever, headache, thirst, sickness and pain, especially in the lower part of the belly. Within twenty-four or thirty-six hours swelling of one or both limbs appears, the left leg most frequently. The limb is hot, tender, swollen perhaps to twice its ordinary size, of a pale white colour, and glazed appearance, tense and elastic, the large vein rolling under the finger like a cord. The acute stage lasts from two to three weeks, but the limb may remain swollen for weeks after the acute symptoms subside, and may be useless for months or never recover its former power and shape.

Treatment.—In the acute stage, perfect rest, simple diet, hot fomentations, one pound of bicarbonate of soda and two drachms extract of opium to a gallon of boiling water, or linseed poultices applied often. The flannel should be wrung out and applied to the tender parts every half-hour or oftener, and should be covered with a piece of waterproof gutta-percha tissue or oiled silk. Two glasses of sherry daily along with boiled milk, 2 grains of quinine and iodide of potassium, twice daily. In the chronic stage, bandaging, change of air. Friction with ammonia liniment, 10 drops of the perchloride of iron in a tablespoonful of infusion of calumba twice daily, before breakfast and dinner.

Varicose Veins.—Is a swelling of the veins next the skin, often looking like knotted cords, and of

a dull leaden or purplish colour. It usually occurs in the veins of the leg, and a predisposition to it is often hereditary. It causes severe aching pain after long standing in one position. A vein may burst, causing dangerous bleeding, or a painful ulcer may form. The causes are long-continued standing in one position, constipation, or anything which presses on the veins and hinders the return of blood. The weight of the column of blood when standing dilates the vein, and the valves are usually burst.

Treatment.—The leg well washed and rubbed dry every day. Canvas stockings, lacing like a pair of stays, to give support to the weak veins. Elastic stockings are very good for those who can afford to get frequent new pairs, for the elastic soon becomes slack and does not give proper support. Bandages of pure india-rubber are perhaps the best treatment. Avoid standing; either walk, or sit down with the leg raised.

GROUP III.

DISEASES OF THE BLOOD GLANDS.

Goitre, or Derbyshire Neck.—Is an enlargement of the thyroid gland, one half of which lies on each side of the windpipe and connected by a bridge of gland substance across the windpipe. It attacks women very much more frequently than men, and is seldom seen before puberty. At first the gland is soft, but as it enlarges it becomes firm and hard, but causes no pain or discomfort till it becomes so large as to interfere with swallowing or breathing. The right lobe is usually larger than the left, but sometimes the distinction between the lobes is lost. It prevails most in hilly districts, and in the Alps, Pyrenees, and Himalayas is often associated with a form of idiocy called cretinism. As the disease is limited to certain districts, the

drinking water is popularly supposed to be the cause, but this is by no means proved yet.

Treatment.—Remove from the infected district. Dissolve 10 grains of iodine and 20 grains of iodide of potassium in a pint (20 ounces) of distilled or rain water, and take one teaspoonful twice a day after breakfast and dinner, add a teaspoonful to the dose every week till six teaspoonsful are taken for a dose. Rub a small piece of compound iodine ointment on the swelling night and morning. When the breathing is much interfered with, the gland may be removed.

Exophthalmic Goitre.—Is the name given to a combination of palpitation with protrusion of the eyes and enlargement of the thyroid gland. It is rare in children, and is more common in women than in men. It accompanies or follows wasting discharges, and is sometimes associated with heart disease. Palpitation is long continued, with a quick pulse, 120 to 140, and whistling sound in the thyroid gland which gives a peculiar sensation to the hand. The disease is usually chronic and continues for months or years, the patient becoming dropsical and breathless, but usually ends in recovery.

Treatment.—Bland food; 10 drops tincture of digitalis, 5 drops tincture of belladonna, 5 grains acetate of potash, and 8 grains carbonate of iron, three times a day. Small doses of morphia, such as 15 drops of the solution of the acetate of morphia, may be required to obtain sleep.

Inflamed Spleen (Ague-cake).—Occurs chiefly in tropical countries from repeated attacks of malarial fever. The spleen may be enormously enlarged, causing a sensation of weight and uneasiness; the face is sallow, the body wasted, diarrhoea, or bleeding often profuse from the bowels, and dropsy of the feet, the patient being greatly exhausted.

Treatment.—Iodide of potassium 3 grains, and carbonate of iron 6 grains twice a day. compound iodine ointment to be rubbed over the spleen.

Waxy Spleen.—Is a part of the general waxy degeneration (see WAXY LIVER, p. 333). Hodgkin's disease is a peculiar enlargement of the spleen and lymphatic glands, with increasing weakness and bloodlessness.

Addison's Disease.—Is increasing weakness till it causes death in about two years along with a peculiar bronze tint of the skin and destruction of the glands resting on the heads of the kidneys (suprarenal capsules).

CHAPTER V.

DISEASES OF THE LUNGS AND AIR PASSAGES.

GROUP I.

THE NOSTRILS AND WINDPIPE.

Catarrh.—Inflammation and swelling of the mucous membranes, which are the membranes lining the air passages and ducts of the body, is called catarrh, and receives different names according to the part affected. In the nose it is called coryza, in the lungs bronchitis, and so on; but it is usually understood of the nose and throat.

The causes of catarrh are very various, and the liability to it varies much in different people when exposed to the same cause; the part affected also differs. Thus, what in one almost always gives rise to a cold in the head, may cause in another cold in the throat, and in a third diarrhœa, from affecting the mucous lining of the bowels. After repeated attacks the membrane wherever situated becomes weakened and more easily inflamed. Badly nourished people, those of weakly constitution, and those of sedentary habits are more easily affected than strong people who are much out of doors.

By far the most frequent cause of all catarrhs, excepting of the stomach and bowels, is chilling of the skin, generally by exposure to draughts of cold air when the body is cooling after being heated, or

by damp feet. A cold is more easily taken after fatigue, when the body is not able to react or resist so powerfully, and when cooling after exertion from the comparatively large amount of perspiration which is passing insensibly as vapour, and carrying off the heat. When a part only of the skin is exposed to the cold, it is more apt to cause catarrh than if the whole body were exposed, as by insufficient clothing. The conjunction of these three causes is the reason of the frequent colds after dances. Long standing or sitting on cold stones and damp feet are other common causes. Damp feet or clothing is more prejudicial than thoroughly wet clothing, from its abstracting more heat; the damp is sent off in vapour abstracting a large amount of heat, and after getting chilled it may fall again inside, the shoes or dress acting as a carrier of heat, while with thoroughly wet clothing the body-heat is unable to vaporise it, and a layer of warmed water is left next the skin. For this reason, in bathing the skin should be very thoroughly dried; an hour in cold water, and I speak from experience, being more endurable than five minutes of undried skin on a breezy day.

Other causes of catarrh are the direct action of irritant substances, such as breathing very cold air, dust, or acrid vapours, extension of a previous inflammation; thus a cold in the throat tends to spread to the lungs, blood poisoning, such as occurs in measles, and, lastly, morbid growths or ulcers.

Cold in the Head.—The symptoms of a cold in the head, which in a minor degree are familiar to every one, are a feeling of languor and general weakness, pains in the limbs, aching in the back, a sense of tightness and feeling of weight in the head, sneezing, watery eyes, obstruction of one or both nostrils, with excessive thin colourless discharge, which often becomes acrid and irritating, and is

followed by dryness, tenderness, and swelling, hoarseness, sore throat, nasal voice, perverted taste and smell, furred tongue, flushes of heat, feverishness, loss of appetite, quick pulse, sometimes shivering and an eruption of herpes (which see, p. 359) at the corners of the lips.

Usually at the end of forty-eight hours the symptoms begin to abate, or pass into a more severe affection, such as quinsy, bronchitis, pneumonia, etc.

Treatment.—When produced by cold to the skin, within the first six hours warmth to the same part of the skin generally stops it, thus, when from cold feet, a hot foot-bath or a hot bottle for half an hour suffices. For colds in the head a large dose of morphia, such as a drachm of solution while the cold is coming on, stops it by arresting the reflex nervous action, but once inflamed, stopping the reflex action is no longer sufficient. If severe, or longer than six hours, 10 grains of compound ipecacuanha powder at bedtime, but the next day must be passed in the house, or the last state may be worse than the first. An agreeable treatment for slight colds is a Turkish bath. Free perspiration, no matter how induced, generally by hot drinks, such as barley water, cream of tartar, and gruel, half an ounce to a pint, etc., solution of acetate of ammonia, a teaspoonful every two hours, may be used, and abundant bed-clothes are the most common and one of the best treatments for all colds. Smear the upper lip with some grease, to prevent the acrid discharge irritating it. Dr. Ferrier's cephalic snuff (2 grains of morphia, 6 drachms of bismuth, and 2 drachms of gum-acacia) often arrests the onset of a cold in the head.

To prevent colds, the neck and chest should be sponged with cold water daily, and damp feet carefully avoided.

Ozæna.—Is a chronic inflammation of the nostrils, which may be due to long-continued attacks of catarrh, especially in scrofulous people. It is an extremely obstinate complaint, often continuing for years with varying intensity. The symptoms are those of a common cold, uneasiness and stuffiness of the nose, headache, and a very foetid discharge which is generally profuse, and which may form crusts of stony hardness which are expelled on blowing the nose. When there are ulcers, the adherence of the membrane to the bone and irritation from constantly blowing the nose hinder their healing. The swelling of the mucous membrane narrows the nostrils, and favours the putrefaction of the secretion.

Treatment.—Principally the general health, cod-liver oil, quinine, and iron. One tablespoonful of oil, 2 grains of quinine, and 6 grains of reduced iron daily. Locally frequent syringing with solution of permanganate of potash, one grain to two ounces of warm water. A snuff of chlorate of potash, 30 grains, sugar half an ounce, may be used.

Bleeding from the Nose (Epistaxis).—Is most common in youth, and may arise without any well-defined cause or from injuries, fever, or obstructed circulation.

Treatment.—Avoid snuffling and wiping the nose, which tend to aggravate the flow, put something cold to the back of the neck and down the spine—a large iron key is popularly used. Hold both arms straight above the head for three minutes, avoid hot drinks, and swallow a tablespoonful of vinegar, repeated in ten minutes if required. If these means do not succeed, plug the affected nostril in front with a piece of lint; and if it still bleeds from behind, an attempt may be made to plug the nostrils on both sides. Pass a loop of thin wire (a device I first saw used by Dr. MacArthur Anstruther) through

the nostril till it is seen in the throat, tie to the loop brought out at the mouth one end of a tape in the centre of which is securely tied a piece of lint of the size of a pigeon's egg, pull back the wire through the nostril, drawing the tape after it, pull the tape till the lint blocks the nostrils behind, then tie the ends of the tape coming from the mouth and nose together, and plug the nostrils in front; after two days the plug may be withdrawn by pulling the tape coming through the mouth.

Sore Throat (Laryngitis).—Sore throat depending on inflammation of the windpipe may be produced by extension of inflammation from the throat, from inhaling acrid vapours or dust, chilling of the skin, or prolonged shouting and singing, making one "as hoarse as a crow"—the altered or lost voice being due to the swelling of the mucous membrane altering the density of the vocal cords, and the slight pain caused by using the muscles making them to be insufficiently used, just as the note of a violin string is altered by being greased, and the string not tight enough. This form (sub-acute) usually subsides spontaneously, or it may require treatment, or become chronic.

In chronic inflammation the voice is hoarse, harsh, and cracked, or even quite lost; there is often a tickling cough, with a frequent desire to clear the throat, and expectoration of small pellets of mucus; occasionally there is slight difficulty of breathing.

Acute inflammation begins like a slight cold and is rapidly followed by fever, redness of the back of the throat, a feeling of burning or soreness in the throat which is made worse by speaking or coughing, difficulty of swallowing, more with liquids than with solids. Hoarse voice, which suddenly cracks or breaks into discord when exerted owing to the swollen vocal cords touching one another, and so, like a shortened violin string, raising the tone; after

a little time the voice is reduced to a husky whisper, or is completely lost. There is a violent cough, at first clear and shrill, soon becoming harsh and brassy, and often begins and ends with a hissing sound, and after a time is lost like the voice. Breathing is usually difficult, from the first a peculiar sound like a whisper accompanying both expiration and inspiration. Inspiration is prolonged, laborious, wheezing, piping, like air drawn through a dry reed, and starts sharp from the previous expiration. Paroxysms of breathlessness occur, during which the face is flushed, the eyes protruded, the pulse hard and quick, and there is great general distress; the windpipe moves rapidly up and down, the chest heaves, and the patient gasps for breath.

In children attacks of breathlessness occur chiefly at night; there may be no symptoms beyond cough and hoarseness in the daytime, but at night the child wakes suddenly with great oppression of breathing, verging on suffocation, and a hoarse barking cough, which is due to the secretion accumulating on the vocal cords during sleep, as it does on the eyelids in chronic inflammation of the lids. The expectoration is at first clear and glairy, but becomes scanty or even absent, and as the disease progresses and begins to abate, it becomes thicker and yellow.

In acute cases the disease usually terminates by recovery in about a week, the hoarseness and cough abating, or it may relapse several times or become chronic, which may last for years.

Treatment.—In acute inflammation, warmth and rest, no talking, or, if any must be done, let it be in a whisper. Restrain the cough as much as possible; each cough is a fresh irritation to the inflamed surface. The air of the room should be kept moist and at a temperature of 70° F. A hot poultice applied round the throat extending to the ears. Inhalation of steam every half-hour for two minutes

at a time; if there is violent coughing, 8 drops of chloroform may be added to the hot water for inhalation. A teapot makes a very good extemporary inhaler. In a strong person, a cold water compress covered with dry bandages is sometimes preferable to hot fomentation or poultices. In the form occurring at night in children, a sponge dipped in water as hot as can be borne applied to the throat and frequently renewed, along with an emetic of 10 grains of sulphate of zinc, are the most effective treatment.

In chronic inflammation, inhalation of steam three times a day, with half a teaspoonful of turpentine to a teacupful of hot water one of the three times. Wearing a respirator, and avoidance of much or loud speaking. If this does not do, gargles of warm salt water, half a teaspoonful to an ounce of water, every three hours, and inhalation of a spray of warm water containing 4 grains of gallic acid and 10 drops of laudanum to the ounce twice a day may be tried.

Ulcers and Dropsy of the Windpipe.— Besides ulcers produced from the pustules of small-pox and in measles and typhoid fever, the top of the windpipe is liable to ulcers from chronic inflammation of the mucous membrane, and especially as a complication of consumption. The symptoms are much the same as those of chronic inflammation, with more tendency to variation, better one day and worse the next. When there is fever, loss of flesh, and night sweats, consumption should be suspected.

The treatment is the same as that of chronic inflammation; ulcers of fevers usually get well of themselves as the fever passes off. Dropsy of the upper part of the windpipe (glottis and epiglottic folds, *œdema glottidis*) takes place very easily, just as we see in the eyelid, and from the same cause, the loose submucous tissue opposing little or no

resistance. The symptoms are somewhat like those of croup, there is rapidly increasing hoarseness or loss of voice, a harsh barking cough and difficulty of swallowing, along with these symptoms there is the most frightful breathlessness. During inspiration the swellings are sucked over the top of the wind-pipe, causing loud, long drawn, forced, sharp, noisy whizzing or hissing breathing, while expiration is tolerably easy and inaudible, there being little obstruction to the air going out, as it drives aside the swellings just as inspiration sucks them together. Along with the difficulty of breathing, there is a feeling of a foreign body in the throat which causes the choking.

Treatment.—Very hot fomentations to the neck. Slowly swallowing small pieces of ice is sometimes of use.

If it can be done the swelling may be touched by a small piece of sponge the size of a pea, firmly tied on a piece of whalebone, and dipped in a solution of nitrate of silver, 7 grains to a drachm of distilled water. An attempt may be made to cut the swelling with the finger-nail nicked at the edge like a saw. When life is endangered by the blood poisoning from insufficient oxidation, which is shown by the countenance becoming livid or lead-coloured, the limbs cool, the pulse small and irregular, and gradually increasing stupor coming on, which, if unchecked, will end in death, an operation (laryngotomy) to open the windpipe should be performed. In cases of urgency this might be attempted by any man not liable to lose his presence of mind. Beneath the edge of the apple in the throat will be found a prominent ring of cartilage, with a soft spot the size of a pea between it and the sharp angle of the apple; through this the blade of an ordinary penknife should be passed, but not more than a quarter of

an inch, lest the gullet should be wounded, which would be dangerous; on withdrawing the knife insert a large quill to breathe through. The air of the room must then be kept warm, at 70° F., and moist, as there is a great tendency to inflammation of the lungs. This operation (laryngotomy) is of no use for croup or diphtheria, as the seat of the disease extends lower down. In one instance I have known life saved by an ordinary pair of scissors being plunged into the windpipe.

Croup.—Is a non-infectious inflammation of the mucous membrane of the windpipe, occurring in children chiefly from the second to the seventh year, or from the first to the second time of teething. Like diphtheria a false membrane is formed in the windpipe, but it merely lies on the true membrane, and when it is removed there is no loss of substance, while in diphtheria the membrane is deposited in the true membrane, and when removed leaves a raw bleeding surface with a loss of substance, leaving a scar. Croup attacks boys more frequently than girls, and those of weakly constitution more than the robust. It prevails most in low-lying damp situations exposed to the east wind. The approach of croup is generally gradual, a very sudden and violent onset being the exception. The first symptoms are a general feverishness and fretfulness of the child, with some peculiarity in the voice, which becomes somewhat harsh, or slight hoarseness occurs, accompanied by a short cough and a feeling of pain in the throat, or in an infant it raises its hand to its throat. After a variable time, usually about eighteen hours, the formidable symptoms of an attack of croup appear, almost always beginning during the night or in the evening. The child is greatly alarmed, the face is red and flushed, the veins in the head and neck distended, the voice and cry are shrill and piping,

and the cough, which was sharp, short, and barking, becomes hoarse, brassy, harsh, and clanging. The voice and cough may gradually be lost; we see the child cough or speak, but do not hear it. Besides these, the characteristic symptoms of croup, persistent, perilous difficulty of breathing appears, which goes on increasing, and is accompanied by a peculiar loud sonorous piping noise, like that which a fowl makes when caught in the hand. The breathing is exceedingly laborious, the child sitting up to give the muscles full play, and the lower part of the chest being drawn in by its efforts. With all this difficulty of breathing, there is no real difficulty of swallowing; if allowed to choose its own time, the child will readily swallow anything given it. After a time the cough, which at first was unattended with expectoration, brings up whitish shreds of membrane which cause increased difficulty of breathing while being coughed up, but leave it easier for some time afterwards. If the back of the throat about the tonsils be examined, it will be seen to be lined with white membrane from the consistency of cream to that of wet pasteboard. There is increased fever with hot skin, thirst, depression, restlessness, and weak, quick, irregular pulse. If the child is not suffocated, the disease remits towards morning, the cough loses its twang, and the crowing inspirations lessen or cease, the fever abates, the voice and sound of the cough returns, and except the piping tone of voice and hoarseness of the cough, there may be no signs of the previous night's scene of terror. but the coming night may bring a repetition of the attack, even worse than the former, and especially is this to be dreaded if the fever continues during the day, and there is a false membrane in the throat. Sometimes the remission in the morning fails to appear, the disease running a continuous course, and in such

cases it is generally fatal. When tending to death, which is either by insensibility or suffocation, or after protracted attacks by exhaustion from insensibility, death is comparatively slow, the flushed face becomes pale, the anxiously gazing eye becomes dim, increasing drowsiness comes, but not proper sleep, the child being uneasy and starting in terror, the breathing is gasping, but loses the crowing sound; if the child tries to take a long breath it brings on a fit of suffocation, during which it starts up and makes violent efforts to breathe, and finally sinks back exhausted; the breathing is quick and short; after a time the successive paroxysms of difficult breathing fail to rouse it, the skin becomes cold and covered with clammy sweat, the pulse small and thready, there may be convulsions, insensibility becomes complete, and in this state it dies. Though there is an apparent struggle at the close, there is no suffering, the blood-poisoning by the retained carbonic acid destroying sensation like chloroform. When it dies from direct suffocation, its last minutes are spent in an uneasy, often violent, struggle for breath which is painful to witness. The total duration of an attack of croup varies from three to twelve days, but the great majority last from four to six days, and are at their height about the third day with white tongue, hot skin, quick pulse, flushed, anxious face, and crowing breathing. Though well-marked croup and diphtheria are very different, yet they approach each other till in some cases it is almost impossible to say which it is. The important practical difference is that diphtheria is infectious, while croup is not, although it is not improbable that both may be got from emanations from sewers and drains, in the same way that ague and typhoid fever might. A form of diphtheritic sore throat which is epidemic is due to defective drainage. Croup is more apt to attack a child which has had

a previous attack, and all the children of one family often show a remarkable predisposition to it; so where one child has been attacked great care should be taken of the rest, till they are twelve years of age.

Treatment.—Confinement to bed in a room kept at the temperature of 70° F. day and night, and the air kept moist by a kettle pouring steam into the room; a piece of piping tied to the spout to prevent the steam escaping up the chimney is of use. Keep the head higher than the body to favour breathing; let the child wear a flannel dress, but avoid all tight clothing, let it drink freely of water, milk, and barley water, apply a succession of sponges dipped in water as hot as can be borne to the throat. Linseed poultices changed every two hours should be persevered with. When an attack comes on, place the child in a warm bath for ten minutes. Give 10 drops of ipecacuanha wine every ten minutes till vomiting is induced. Give 1 grain of calomel every two hours till the bowels are freely moved. When there is an appearance of sinking, stimulants, such as strong beef tea and wine, must be given and ipecacuanha stopped. If there is no improvement in twelve hours, and a surgeon is within reach, opening the windpipe (tracheotomy) should be performed, but it is not always suitable, and requires more skill than opening it high up for foreign bodies or dropsy of the windpipe (œdema glottidis). However well the child appears, it should be always watched at night, and not let out of the house till a fortnight after an attack.

GROUP II.

THE LUNGS.

The lungs are two large, light, spongy bodies of a conical shape having the heart between them, and

filling the upper part of the chest above the midriff (diaphragm), or muscular partition which separates the contents of the chest from the belly. The tops of the lungs begin in the neck about an inch above the collar-bone, and touch each other in the middle line between the first and second ribs; they continue touching till they reach the level of the fourth rib, when they begin to separate, allowing a part of the heart to come in front. The base of the lungs is hollowed out to receive on the right side the projection of the liver, which rises as high as the fifth rib, and on the left side the lung is less hollowed to receive the stomach and spleen, which rise as high as the sixth rib. Both lungs extend much lower down behind than in front, the left being the lowest, and extending below the (twelfth dorsal vertebra) level of the last rib. The right lung is shorter and thicker than the left, overlapping the liver and reaching down to the sixth rib in front. It is divided into three lobes, which correspond to the first divisions of its branch of the windpipe.

The left lung is longer and narrower from the heart, being chiefly on its side, and reaches to the seventh rib in front. It is divided into two lobes, corresponding to the first divisions of its branch of the windpipe.

Taking a breath or a permanent state of inspiration by expanding the lungs causes the tops to rise higher and the bases to descend lower, and a longer part of the two lungs to touch; while expiration reverses this, the difference in length of the lungs between the two states being an inch to an inch and a half.

The lungs are composed of a number of air vessels or bronchi, branching like the branches of a thick tree till they end each twig in a group of minute air cells or vesicles (lobule) formed of a tough membrane, which is lined outside by a very close

network of blood vessels. Between the air vessels or bronchi are connective and elastic tissue, blood vessels, lymphatic vessels, and glands, forming the lung substance. The larger air vessels or bronchi are composed of cartilaginous rings, something like the windpipe, with circular muscular fibres and elastic tissue, the whole lined inside with a smooth, tough membrane, but in the smallest bronchi and in the air vesicles the membrane alone is left.

Outside, each lung is lined with a smooth, shining, serous membrane, called the pleura, which after lining the lung goes round the inside of the chest, lining the cavity in which the lung is situated. Thus the contiguous surfaces of the lung and of the chest wall are alike coated by the same slippery membrane, and friction is minimised. In pleurisy a quantity of fluid may separate the lung from the chest walls, but to make room for the fluid the volume of the lung must be diminished by compression. The function of the lungs is to supply oxygen to combine with the tissues or products of the food, in order to supply heat and power of work or energy to the body (see CHLOROSIS, p. 126), and also to get rid of waste products of burnt tissue in the shape of carbonic acid and water. In order to do this the air vesicles of the lungs present a surface estimated at thirty times as much as the surface of the skin, where the impure blood from the right side of the heart gives off carbonic acid into the air and takes in oxygen by the red blood corpuscles, which give it off again where it is required in the tissues. In ordinary breathing a man on an average breathes 25 cubic inches of air at each breath, but he can inspire or expire another 100 cubic inches by a forcible effort, and even after complete expiration there is 100 cubic inches of air left in the lungs, so that the total amount after the deepest possible breath is 225 cubic inches. The

air breathed out contains about forty volumes of carbonic acid in a thousand parts, while pure air only contains from a fifth to half one volume. When the air of a room contains one and a half to three volumes it causes headache and giddiness, while if it increases to twenty volumes it causes stupor and suffocation.

In ordinary health, the number of respirations in a minute is from fifteen to twenty, or one breath to every four beats of the pulse; but it is largely increased by exercise and various diseases, in which it often forms an important sign both as to its frequency and fulness. During sleep and in a few diseases the frequency is diminished; if much diminished it is generally an unfavourable sign. Expiration is longer than inspiration.

To detect changes in the lungs indicating disease, as we can neither see nor touch them, we must be content with hearing, and to a less extent the resistance to shock. The principles by which we judge of the state of the lung are purely mechanical and depend on the facts that—

1st. Air in passing through tubes gives a shriller or more treble sound the smaller and shorter the tube.

2nd. Large bubbles produced by air passing through a tube give a graver or more bass sound when they burst than small bubbles.

3rd. Dense solids give a duller sound when struck, and conduct sound better, than porous bodies, and an empty closed cavity gives a still lighter and more resonant sound, of which an empty cask, a cask filled with cotton wool, and a cask filled with water may be taken as examples. A corked empty tin flask floating in a cask filled with water would give percussion sounds comparable to those given by a cavity in the lung. For listening to the sounds produced in the chest, or

auscultation, medical men use an instrument called a stethoscope, "the wooden idol of the profession," as it has been called, the advantage of which, beyond its convenience, is that it localises the sound and so prevents confusion of two sounds. For ascertaining differences in density of the lungs or level of fluid in the chest a finger is laid on the part and smartly tapped with the pulp of another finger, which is called percussion.

That we may be able to judge of the changes in the chest, we must first hear the sounds and then interpret them; this cannot be done at the first trial any more than learning to play the piano; a skilful stethoscopist being as rare as a good pianist, while for delicate percussion both a nice sense of touch and a musical educated ear are necessary. Excepting for very loud sounds, such as are heard in bronchitis and asthma, it requires training and practical experience to hear them, and still more to judge of their causes and probable consequences.

Hay Asthma is a peculiar form of asthma and also fever called Hay Fever, which affects certain persons during the months of May and June while hay-making is going on. It is caused by breathing the pollen of the sweet-scented vernal grass (*anthoxanthum odoratum*). Breaking ipecacuanha powder has the same effect on others, and in some even fine dust not known to contain anything specific has the same effect, acting perhaps by its mechanical action. The symptoms are sneezing, watering of the eyes and running at the nose, severe headache, chiefly in the forehead, cough, difficulty of breathing occurring in paroxysms and accompanied by a wheezing sound.

The liability to it is often hereditary, but though troublesome it is never a dangerous affection. It is not brought on by cold or other causes of catarrh.

Treatment.—Avoid going near hay-fields, or if this cannot be done wear a cotton-wool respirator,

covering both mouth and nose. Sponge the chest daily with cold water; 2 grains of quinine, and 6 grains phosphate of iron daily. During an attack breathe very dilute chlorine gas if it can be had; if not, half a drachm of ethereal tincture of lobelia repeated in an hour if necessary. In some chronic cases arsenic is of use, 5 drops of solution thrice daily after meals.

Bronchitis is an inflammation and swelling of the lining membrane of the air tubes or bronchi; the natural mucous membrane is at first arrested and then becomes increased and altered in quality. It is perhaps the most common of all diseases, nearly every one having occasionally had "a cold on the chest," and next to consumption in this country, it is the most fatal, especially to the aged and infants. No disease varies more in its degrees of severity than bronchitis, from slight and easily cured colds to the most dangerous and unmanageable forms. Certain conditions predispose to bronchitis, and in such an attack is excited by what would have no effect on most persons. Those conditions are: (1) childhood; (2) badly fed people of weak fibre; (3) a constitutional tendency to it as in the scrofulous—such persons are said to have a delicate chest; (4) previous attacks. The direct or exciting cause in by far the most cases is chilling of the skin, especially when heated; (1) such as sitting in a draught when perspiring, or damp feet, which causes bronchitis by reflex action: other causes are (2) extension of a cold in the head down the windpipe; (3) direct irritants to the mucous membrane, such as dust, common with millers and stone cutters; irritant gases or vapours; very cold or hot air. Drapers die frequently of bronchitis and consumption due to defective ventilation and fluff in the air of their shops; (4) obstruction to the blood, such as by heart disease or continued flatulence, leading to

congestion and bronchitis; (5) blood poisons, such as measles, typhoid fever, and small-pox.

The danger is in proportion to the smallness of the air tubes involved, the small ones being choked up by the swollen membrane and secretions, while the large tubes are almost as wide as before. Inflammation of the small tubes (capillary bronchitis) occurs mostly in children and old people, the vigour of adult life resisting the extension of the disease. It may produce two directly opposite results: in some the small tubes are choked, the air in the cells absorbed, and the walls come together, or the viscid mucus may act like a valve, allowing the air to pass in but not out, producing emphysema.

Acute Bronchitis (*usually accompanied by fever*).—(a) Of the larger tubes (severe common cold on the chest). The symptoms described with cold in the head, pains all over, aching in the back, limbs, and joints, tightness across the forehead, chilliness, discharge from the nostrils, copious flow of tears, hoarse or rough voice, dry throat, furred tongue, thirst, loss of appetite, quick pulse, and fever, may precede the attack, but it generally begins with a sense of uneasiness, seldom amounting to pain, at the root of the windpipe behind the top of the breast-bone, which soon passes down the whole length of the bone, giving rise to a feeling of rawness with tightness and oppression of breathing, but no catch or stitch even on taking a full breath, and accompanied by frequent yawning. The voice is hoarse and altered. After a short time a dry cough, that is without spit, begins and increases the irritation. The patient feels as if there was some foreign body in the chest, and makes violent but ineffectual efforts to cough it up. After twelve to twenty-four hours he begins to spit small quantities of a thin, frothy, glairy, saltish fluid, and soon after small irregular masses like pearls. In

other twenty-four to thirty-six hours the cough is easier and can to a certain extent be repressed; when it does occur there is no longer the great uneasiness and feeling of tearing formerly produced. With each cough opaque yellowish spit, no longer frothy, is brought up with ease and a sense of great relief. The quantity spit in twenty-four hours varies from a few spits to a pint. The breathing is hurried (thirty-six to sixty-eight in a minute), and the pulse is small and quick (120 to 150).

(b) Acute Bronchitis of the smaller tubes (capillary bronchitis) is one of the dangers of children from hooping cough. The attack may begin with shivering, headache, furred tongue, pale face, an anxious expression and incessant hacking cough, with general weakness as in the first stage of a fever. The pain is chiefly at the insertions of the muscles on the chest, and is due to the continuous violent jerking of the cough. The breathing becomes hurried and laborious, and along with the cough there is an occasional spit of one or more greyish-yellow pellets, which if spit into water show thread-like branches hanging down, which is the secretion of the small tubes hanging to the lighter frothy secretion of the larger tubes. These symptoms go on increasing, the breathing becoming quicker and more difficult, and the breathlessness increasing. The respirations may amount to seventy in a minute, and the pulse to 120 or 130. After a time, as mucus accumulates and chokes more tubes, the lips, fingers, and toes become livid or lead-coloured from deficient oxidation of the blood, drowsiness and stupor begin and gradually go on increasing to the fatal termination. One reason why it is so fatal to children is the great difficulty they have in coughing up the spit.

Chronic Bronchitis (*usually unaccompanied by fever*) is very common in advanced life. It may

remain from an acute attack or begin as a chronic form. The most characteristic symptom is the cough, which is habitually full and easy, not like the dry difficult cough of beginning acute bronchitis, though there may be an acute aggravation of the disease, making the cough difficult and painful. The cough is more frequent in the morning after waking and in the evening than during the day, and the spit is usually abundant, consisting of opaque masses of a dirty white, greyish or greenish colour, occasionally with an offensive odour. Winter cough, occurring at first during spring or autumn, till finally it remains more or less all the year round, is of this description.

(c) Plastic bronchitis with casts of the tubes is a chronic form of bronchitis in which a false membrane is thrown out on the surface of the small tubes and air cells. It generally occurs between twenty and fifty years of age in persons of a delicate constitution, scrofulous, or with a tendency to gout or rheumatism. The spit when thrown into water gradually expands into a stem and branches like a tree, the main stem being from the thickness of a crowquill to a pencil, and either solid, of a dull white colour, or hollow, of a brownish colour, from admixture with blood. They are gradually formed by exudation in the air tubes, and cause slight symptoms of bronchitis till coughed up, when immediate relief follows, lasting till a new accumulation forms. It is not very common and is not immediately serious.

Treatment.—At the beginning of a common cold in an adult, with hoarseness and tendency to cough, if the appetite is still good, it may be subdued by a full supper and what used to be called a night-cap, that is, a tumbler of hot spirits or wine and water. If tolerably severe, but not of long duration, 1 grain of opium and 6 grains of carbonate of

ammonia at bedtime and confinement to the house next day generally suffices; the effect being to arrest the perverted nervous action, which by reflex action from the skin is the cause of the cold. If such remedies are too long delayed, the next object to be aimed at is to excite copious perspiration, with action of the kidneys, and restore the moist state of the bronchial mucous membrane. The membrane being now inflamed, stopping the perverted nervous action is not sufficient; we must endeavour to soften the expectoration and make the coughing loose and easy. This is best done by small doses of expectorants (medicines which encourage spit), such as 10 drops of ipecacuanha wine every two hours. Inhaling steam, say three minutes every two hours, with 10 grains of acetate of potash three times a day. When the affection has lasted some time the potash may be replaced by half a drachm of syrup of squills and 15 drops of tincture of hyoscyamus four times a day.

In acute bronchitis the chest must be covered with hot poultices and an oil-silk jacket worn over it to prevent the steam and heat escaping. A single dose of cream of tartar half an ounce to be taken in warm gruel, and ipecacuanha, 10 drops of the wine, every two hours till the cough is loose. A mustard poultice once a day till the skin is red (the time varies in different people), and after the fever has subsided, if cough and difficulty of expectoration remain, a fly blister may do good. Ipecacuanha must not be given to children or to very weakly people on account of its depressing action. Carbonate of ammonia must be given instead, 2 grains every three hours for an adult. The food should be fluid, milk and soda-water, beef tea, gruel, tea, etc. The patient should be confined to bed, and the air of the room kept moist between 65° and 70°.

In chronic bronchitis the bowels should be opened by 20 grains of compound jalap powder, and afterwards kept gently open when required by sulphate of magnesia 1 drachm, or 2 drachms solution of acetate of ammonia, and a tumbler of water. 20 drops each of ipecacuanha wine and compound tincture of camphor should be given thrice a day; but if the person is weak, replace it by 5 grains carbonate of ammonia, and 15 drops compound tincture of camphor. Steam should be inhaled twice a day, and a teaspoonful of turpentine placed in the hot water once every second day. A daily spoonful of cod-liver oil; a mustard poultice to redden the skin every second day; nourishing food; wine when there is much weakness, two glasses of sherry daily; and a respirator, to be worn when exposed to cold air, are the other measures to be taken. Occasional Turkish baths in slight cases are useful.

Dilated Air Tubes (Bronchiectasis) may arise of itself or secondary to many diseases of the lungs. The disease is not uncommon, and may terminate in consumption. When a lung diminishes, either bodily, as by cirrhosis, or partly, as from pneumonia or abscess, the ribs do not yield to fill up the space; hence there is a partial vacuum, and the pressure of the air on the bronchi slowly dilates them. The disease comes on slowly with symptoms of bronchitis; there is frequent cough occurring in paroxysms, and which is soft, moist, painless, bringing up with difficulty large quantities of spit of an offensive odour. There is impaired general health, breathlessness on exertion, and offensive breath from the secretion lying in the enlarged tubes putrefying; the spit is in large quantity of round foetid masses and brought up occasionally after coughing; from the putrefaction of the secretions there is sometimes death from pyæmia. I

have attended a case in a child where more than a dozen abscesses formed successively in different parts of the body.

Treatment.—Inhalation of steam with 10 drops of creasote in the hot water twice a day; 10 drops compound tincture of camphor every two hours to relieve the cough; a mustard poultice over the chest every second day to redden the skin; with milk diet and a daily spoonful of cod-liver oil.

Asthma is a complex and capricious disease, occurring in paroxysms of difficult breathing of variable duration, and is caused by spasmodic contraction of the circular muscular fibres of the smaller bronchi. It occurs at all ages, though more common in adults, and not unfrequently it is hereditary. Except when connected with certain organic changes in the heart and lungs, the sufferer may enjoy tolerably good health between the attacks, the intervals between which vary from a few minutes in severe cases, for a succession of several attacks when it may subside, to a year or even more in very slight cases. The direct exciting causes of the attacks are very various. They may be due to exhaustion and fatigue; to sudden violent mental emotions; to irritation of the stomach from irritant indigestible food—cheese, nuts, almonds, raisins, sweets, salt meats, highly-spiced food, malt liquors, or sweet wines; to skin eruptions; to irritation from loaded bowels.

A fit of asthma is preceded either by headache and sleepiness or various digestive disturbances, or it may occur suddenly without warning. The attack generally occurs at night, and if the sufferer should be asleep it gives rise to uneasy slumber and frightful dreams; when he awakes he has a great desire to draw a deep breath, but feels that the air does not penetrate into the chest beyond a certain point. There is a sense of suffocation or constriction about

the chest, with increasing difficulty of breathing, till it becomes a painful struggle for breath. The chest is expanded to the utmost, the arms braced, and the head thrown back to favour breathing, but in vain. Loud wheezing and shrill whistling, or hissing, of every variety of note and pitch, and which may be heard a considerable distance away, accompany the breathing, loudest on expiration, and disappearing from one part of the lungs to appear in another, showing that the spasm of the muscular fibres has relaxed in one spot to appear in another. The countenance is anxious, the eyes widely opened and staring, the face pale, the lips purple, the forehead covered with cold sweat, the pulse small and weak. The attack, after lasting a quarter of an hour to several hours, often terminates by expectoration of mucus, which may be light and frothy, thick and heavy, or in severe forms a few dark pellets. The attack may end suddenly, the air rushing into the cells, or gradually accompanied by loud belchings of air, yawning, or rarely a fit of coughing; after which the attack ceases, and the sufferer falls asleep. Most asthmatics are thin, round-shouldered, hollow-cheeked, and have a hoarse voice and slight cough.

Treatment.—Asthma is as capricious in its cure as in its cause, often requiring a number of drugs to be tried in succession before the best one for any particular person is found. During the attacks, if the stomach contains an undigested meal, an emetic of a teaspoonful of ipecacuanha wine should be given, followed, after retching has subsided, by half an ounce of cream of tartar in a glass of water, a mustard poultice applied to the front of the chest, and a small cup of very strong coffee, or a glass of spirits taken. If the attack still continues, 12 drops of chloroform may be tried every quarter of an hour. Often at the beginning of an attack a large dose of laudanum (Tinct. opii), 20 drops, will relieve directly.

Smoking stramonium cigarettes or *cigare de Joy*, or inhaling the fumes of Himrod's Cure for Asthma or some of the various powders sold as asthma cures, give great benefit in many cases, and often cut the attack short.

During the intervals the patient must avoid all causes, no matter how seemingly trivial, which in his experience have led to attacks. Thus sleeping in a room with the door closed excites attacks in some. If he has a choice of climate, a pure dry atmosphere is to be preferred, avoiding dusty, smoky, or windy places. (Smoke is sometimes curative.) But it is especially the diet that should be attended to. Breakfast at 8 A.M., dinner at 1 P.M., and supper at 7 P.M. No fluid of any kind to be taken for an hour before or three hours after dinner and supper; malt liquors to be avoided. A daily cold shower or sponge bath, and in the severer cases 3 grains extract of conium, with $\frac{1}{8}$ th of a grain extract of belladonna. to be taken at 7 A.M., 12 noon, 5 P.M., and 10 P.M. A change of air not unfrequently cures asthma, which may be very persistent if the patient stays in his own locality.

Emphysema is a disease of the lungs which occurs in two forms: one vesicular, in which the air cells or vesicles are largely expanded, the walls waste, and several cells are thrown into one; the other, interstitial emphysema, occurs suddenly after a violent effort, when some of the air cells rupture and the air gets in between the cells. When the affection is of small amount it causes no particular inconveniences, and is not inconsistent with attaining a good old age, but if considerable the patient is short-winded and distressed by a constant sense of fulness and oppression at the chest, often with attacks of asthma. The breathlessness is increased by exertion, with weak voice, feeble cough, dusky face, stooping gait, frothy spit, weak slow pulse and

lowered temperature of the body ; if the disease increases there is loss of flesh and strength, going on to general dropsy from the hindrance to the passage of blood through the lungs, and consequent increase of blood pressure in the veins, causing transudation of the watery part of the blood. The chest becomes round and barrel-shaped, and a full expiration cannot be made, the chest being still prominent after all the breath that can be expelled is breathed out. A small amount may be due to collapse of a part of the lung, when the rest has to expand to fill the vacant space, the walls of the chest preventing its falling in. Larger amounts are usually due to violent expiration, such as prolonged playing on wind instruments or whooping cough, the midriff pressing up the air in the lower part of the lung, and not being allowed to escape, the pressure gradually enlarges the air cells at the top of the lung. Bronchitis is another cause, the secretion in the small tubes sometimes allowing air to pass in but not out again.

Treatment must be directed to prevent further extension of the disease, the distended cells being incapable of returning to their former size, several cells having run into one. Good food, warm clothing, rest, and a warm climate if possible ; and the treatment of asthma for paroxysms of breathlessness.

Bleeding from the Lungs (Hæmoptysis) is not of serious consequence when it is of small amount, not repeated, and due to some passing cause, but when frequently repeated, or of large amount, it is very apt to be followed by consumption, some of the blood flowing back into the air cells and setting up chronic pneumonia ending in consumption. Consumption may be either a cause or an effect of the bleeding. It may be caused by a cavity eating into a blood vessel, and resulting in a profuse, perhaps fatal, bleeding ; or by rendering the walls

of the minute arteries pervious to the blood; and, as already mentioned, it may be an effect from bleeding even in a strong and vigorous person. In most cases of even sudden and profuse bleeding there is no blood vessel opened, the blood coming from the membrane of the lungs in the same way that it does from the nose in spontaneous bleeding, or from the congestion caused by fevers. Bleeding from the lungs is not often fatal at the first attack, and patients may survive an enormous loss of blood. I have attended a patient who lost three pints of blood and spit in three days, and yet six months afterwards was in tolerably good health.

Treatment.—Strict rest, lying in bed with the head and shoulders raised on pillows. No talking to be allowed, and the cough to be repressed as much as possible, cold air allowed to blow over the chest, small pieces of ice to be sucked, and ice applied for one minute at a time to the chest. Twelve grains of gallic acid repeated in half an hour, if necessary: if not at hand, any of the following may be used:—Ergot of rye, 40 grains; turpentine, a teaspoonful; vinegar, two tablespoonsful; dry common salt, a teaspoonful. Whichever is used the dose is to be repeated in half an hour if required. All food must be taken cold or lukewarm for five days after the bleeding, and the patient must not leave his bed for that time even for an instant. Like bleeding from the nose, it is sometimes very obstinate.

Inflammation of the Lungs or Pneumonia presents several well-marked forms.

I. **EXUDATIVE PNEUMONIA.**—Where an exudation is thrown out into the air cells, forming a solid mass of condensed lung tissue.

II. **INTERSTITIAL, OR CIRRHOSIS.**—Where the fibrous tissue between the cells is increased, and shrinks, crippling the lung; this is chronic, and will be considered under Consumption (*which see*).

Of the first form (Exudative Pneumonia) the varieties are:—

(a) *Lobar*.—Where a whole single lobe of a lung is affected, about twice as often in the right lung as in the left, and usually in the lower lobe, in more severe cases the upper lobe. The lobe is

1. Congested, the vessels gorged with blood.
2. The air cells become filled with blood corpuscles (red hepatisation).
3. The red exudation becomes grey.

4. It softens into pus, the lung being like a sponge filled with pus. This form of inflammation is most common in adults, and may terminate by restoration to health, abscess of the lung, gangrene or death of a portion of the lung, or consumption. If the pulse is above 120, the breathing more than forty times in a minute, and the temperature above 104° Fahr., it is a severe attack.

(b) *Lobular or Catarrhal Pneumonia* affects groups of cells, or lobules scattered all over the lungs.

1. *Bronchial Pneumonia* is always preceded by bronchitis, the inflammation spreading from the bronchi to the air cells and lung tissue. Acute bronchial pneumonia is the ordinary form in children, but rare in adults; along with capillary bronchitis it is a very frequent source of death in children. Chronic bronchial pneumonia is a consumptive or scrofulous form of pneumonia (see CONSUMPTION, p. 268). This pneumonia is always preceded by catarrhal bronchitis, which extends into the air cells of the lungs, and sets up numbers of small pneumonias each affecting one lobule.

2. *Metastatic Pneumonia* is produced by pus or clots getting into the circulation and sticking in the minute blood vessels of the lungs, where, if the pus is infective, it sets up an abscess.

Symptoms and treatment of all the acute forms

of pneumonia are the same. The disease generally begins with a single strong shivering fit, and feeling of cold, though the temperature is really increased. In children the shivering fit is often replaced by convulsions, the temperature rapidly rises to 103° Fahr., or more, the face is red and flushed, there is pain in the side, but not of the sharp, stabbing character of that in pleurisy, unless it is also present, and it is felt at the point where the inflamed lung touches the wall of the chest. It is made much worse by a deep breath, coughing, sneezing, or pressure on the chest. The pain gradually abates or ceases, and in old or very weakly persons may be absent from the beginning. There is thirst, white tongue, confined bowels, hot, dry skin, no appetite, and thick, scanty urine. The patient generally lies on his back, and has a frequent, short, harsh cough, which he strongly endeavours to repress on account of the pain it causes. There is a tenacious, gluey, rusty-coloured spit, which is apt to stick to the mouth. The breathing is very rapid, forty or more short breaths being drawn in a minute, from which speech is interrupted; even a short sentence cannot be finished without drawing a fresh breath. There may be delirium towards the evening. In very severe attacks tending to a fatal termination, the face becomes dusky in colour, the tongue brown, sweats break out over the body, and delirium of a low, muttering type, passing into stupor, comes on.

In the aged and weakly, cough, pain, breathlessness, and the characteristic spit may be wanting, the only signs in the absence of a stethoscopic examination being extreme weakness, quick breathing, and fever. The symptoms of the disease continue constant, or go on increasing till about the end of the first week, when a striking change often takes place in the course of a few hours.

The temperature and pulse fall, the breathlessness abates, and the patient feels freer and easier, and in the course of twenty-four hours convalescence is often fully established, the patient sleeps, and calls for food, rejecting slops with contempt. The total duration of the disease in uncomplicated cases is about fourteen days. In some cases there is merely a short remission, the disease growing worse again, the patient becoming very weak and wildly delirious, or lying in a state of stupor; but a change for the better may still take place about the end of the second week.

Death may take place from blood-poisoning, the inflamed lung not being able to aerate the blood coming to it, and the extra pressure on the remainder leading to the effusion of fluid into the air cells (œdema), a kind of internal dropsy. When this takes place the uneasiness becomes greater, the breathing louder, the face more livid and swollen, the cough more harassing, the spit more abundant, and the attempt to lie down becomes impossible. In other cases death may take place from exhaustion.

Like all other inflammations, one attack leaves the part weakened and more liable to subsequent attacks.

Treatment.—Perfect rest in bed, the air of the room being kept moist by a kettle steaming into it and at a temperature of 65° to 70° Fahr. Poultices of linseed meal applied across the back from the top of the shoulder-blade to the middle of the back every three or four hours. These should be made very thick, and fastened around the neck to prevent them slipping down, and the linseed should be next to the skin. If oakum cannot be obtained, house flannel or brown paper makes the best poultice cloths. When changing the poultices, the patient should be disturbed as little as possible. The medicines required are different in almost

every case, and no general rule can be given for their selection. Two grains of ipecacuanha every six hours, with the like amount of carbonate of ammonia if there is weakness, is perhaps the most generally useful remedy. If there is much weakness, four tablespoonsful of sherry every three hours, or one tablespoonful of brandy every four hours, along with beef tea and milk. Small doses of opium, 1 grain every six hours, when the pain is severe. A large linseed poultice over the seat of pain in chronic cases. Iodide of potassium, 3 grains twice a day, along with nourishing diet, and daily a spoonful of cod-liver oil. Blood-letting at the commencement, calomel, antimony, blisters, quinine, are all used in different cases with good effect.

Consumption (Phthisis).—Consumption is the most fatal of all diseases in this country, causing one-seventh of the whole number of deaths. By consumption is understood a condition of lung ready to break up and form cavities, and till recently it was supposed to be always due to the formation of a growth called tubercle, which is the result of a peculiar state of constitution—the scrofulous constitution. You may, and often do, have scrofula without tubercle; but you never find true tubercle without scrofula. In infancy it is most apt to be found in the head, causing water-brain fever (acute hydrocephalus); in childhood, in the glands of the bowels, causing consumption of the bowels (tabes mesenterica); and in adolescence, it attacks the lungs. It is now known that consumption may be due to

1. Tubercle.

2. Chronic pneumonia of various kinds.

Tubercle (miliary) is a growth of numerous small semi-transparent grey bodies about the size of a pin's head, which grow under the mucous membrane of

the small air tubes and air cells. When several touch each other they excite a small pneumonia or inflammation, the exudation of which mats them together, and they undergo fatty degeneration, forming *yellow tubercle*, a cheesy-looking mass the size of a bean, which is usually surrounded by a ring of fresh young *grey tubercles* (miliary). The yellow tubercle then usually softens and breaks down, leaving a cavity. In acute spreading consumption, the walls of the cavities are of soft, cheesy, breaking-down tissue; if the process is arrested, the cavity becomes lined with a mucous membrane, shrinks, and may heal entirely, leaving a scar in the lung.

The following are the varieties of consumption:—

Acute	{	<i>Acute Miliary Phthisis.</i>
		<i>Acute Pneumonic Phthisis</i> , or Galloping Consumption (<i>Phthisis florida</i>).
		<i>Tubercular.</i>
Chronic	{	<i>Pneumonic.</i>
		<i>Tuberculo-Pneumonic</i> (the most common form).
		<i>Cirrhotic.</i>

Acute Consumption is comparatively rare. *The purely tuberculous form (miliary phthisis)* causes death before there is any destruction of lung tissue, the lungs being uniformly speckled with grey miliary tubercle. Death usually takes place within five weeks with symptoms not unlike typhoid fever, for which it is sometimes mistaken. In one case I have seen, which occurred in a young woman twenty years of age, there were no signs of any kind for the first ten days, beyond a scrofulous constitution and persistent high temperature (103° F.); she was unaware of anything being wrong with her lungs, having sought advice for quite a different ailment. Great weakness, hurried breathing, slight cough, profuse sweats, and

finally delirium appeared, the patient dying in the fifth week after high temperature set in.

Galloping Consumption (*Acute Pneumonic Phthisis*) is a somewhat more common form, though still rare compared with the chronic forms. It usually commences suddenly with shivering, fever, rapid pulse, pain, cough, breathlessness, and soon after hectic fever, which is a peculiar form of fever, occurring in wasting diseases with remissions and aggravations. The face is pale or waxy-looking, with rosy spots or flushes, especially over the cheek bones, the pupils of the eyes are usually dilated, the fever increases and the skin gets hot towards evening and diminishes again towards morning, when the patient falls asleep, and awakes bathed in sweat of a more or less sourish smell, and which is termed colliquative, because it seems to melt the patient away. Along with the hectic fever there is rapid loss of flesh and strength, and often diarrhœa: cavities form in the lungs, and death takes place from exhaustion in three to ten weeks from the commencement of the disease. It arises from extension into the air cells of bronchitis, setting up lobular pneumonia (small inflammations of separate lobules), which does not heal but softens and breaks down into cavities, and has the same relation to chronic consumptive pneumonia that an acute inflammation has to a white swelling or sero-fulous external inflammation.

Chronic Consumption has much the same symptoms from whatever cause it arises.

Pure Tuberculous Consumption—that is, in which there are no symptoms till tubercles form, excite local inflammation, degenerate and break down—is the rarest form of ordinary consumption. There is no premonitory bronchitis, cough, or spit. Fever and wasting, with loss of strength, shortness of breath, and pale features, precede the cough, spit, and changes in the chest usually by several weeks.

The voice and cough become hoarse, and exhaustion is hastened by profuse diarrhœa from tubercle becoming deposited in the bowels, the patient generally dying in a few months.

Tuberculo-pneumonic Consumption, on the other hand, is much the most common form of this deceitful and deadly disease. In this form bronchitis extends to the small air vessels and air cells, setting up lobular pneumonia, the exudation of which is soon surrounded by crops of tubercle, and the mass degenerates, softens, and breaks down, forming cavities. One lung only may be affected, in which case it is generally the left lung, but more commonly both lungs are affected, beginning at the top or apex, and the left lung being more extensively affected than the right; cough and spit preceding the signs of consumption proper by a variable time, usually from two to three weeks.

Chronic Pneumonic Phthisis.—Any form of pneumonia may leave a hardened portion of lung which, after a time, under peculiar circumstances, softens and breaks down, forming a cavity instead of immediately being liquefied and becoming absorbed. This usually occurs from a long-continued bronchitis setting up chronic inflammation or pneumonia of the separate small lobules, which in feeble constitutions passes into consumption.

Cirrhotic or Fibroid Consumption is a form of diffused chronic pneumonia, in which the fibrous tissue only, or chiefly, of the lung substance becomes chronically inflamed and afterwards slowly shrinks, occupying less space, by which the chest contracts and the bronchi dilate into round oblong spaces, the lung tissue becoming compressed and impenetrable to air.

This kind of consumption is common among coal miners, stone masons, file grinders, etc., the constant inhalation of the particles causing irritation and

setting up a slow inflammation of the fibrous tissue. It may also be produced by a prolonged course of spirit-drinking, the ordinary drunkard's consumption, and also from fibrous tissue replacing the absorbed material of pneumonia, the fibrous tissue afterwards shrinking as we see in the scars of external wounds. This form of consumption is commonly a considerable time in running its course, often extending over several years.

Symptoms.—In the great majority of cases, the earliest symptom is a cough, at first slight, dry, unaccompanied by spit, and occurring at particular times: upon rising from bed in the morning (always a suspicious sign), on making any violent exertion during the day, and again at night. The cough may cease almost entirely during warm weather, to return again when it becomes cold, and go on gradually increasing. Cough without any apparent cause is always to be regarded as an alarming and suspicious circumstance. If the commencing spit shows sharply defined deep yellow streaks, it is a bad sign, showing that the small bronchi and air cells are involved.

The breathing becomes more frequent (it is fifteen to twenty times a minute in health). Flying pains about the collar-bones occur of a dull aching character, but are not unfrequently absent. Very often there is bleeding from the lungs, varying from a few streaks of blood in the spit to copious bleeding, which may occur at any period of the disease, and often recurs repeatedly. Hectic fever (p. 28) creeps on insidiously, with pale face and a beautiful pink rosy flush over the cheek bones. The appetite becomes less, and there is a dislike for fatty food. The pulse becomes quick and weak, perspirations occur chiefly during sleep, and often very profuse, so as to soak the night-dress. The spit is in rounded globular masses resembling coins, and hence called

nummular sputum, but this may also occur in some forms of bronchitis. The spit often contains elastic fibres of lung substances, visible under the microscope, from the walls of the air cells, which is a sure sign of consumption, and sometimes hard grains of degenerated lung. Wasting sets in early, and bodily strength and flesh rapidly pass away. The fever is generally about two degrees higher in the evening than the morning. There may be no increase of temperature in the morning, and a temperature of 102° Fahr. or more by five o'clock in the afternoon. Diarrhœa frequently sets in towards the close, and the consequent exhaustion terminates the scene, or a profuse flow of blood from the lungs may be the immediate cause of death. Sometimes a fistula in the bowel is one of the earliest effects of consumption. The duration of consumption varies considerably. Of 314 cases observed by Louis—

24	died within 3 months.
69	„ between 3 and 6 months.
69	„ „ 6 „ 9 months.
32	„ „ 9 „ 12 months.
43	„ „ 1 year and 18 months.
30	„ „ 18 months and 2 years.
47	„ „ 2 years and 40 years.

Thus more than a half died within nine months of the disease showing itself. Though no period of life is exempt from this scourge, yet it is most common between the ages of eighteen and twenty-five.

When a patient with chronic bronchitis, which has no ill effect on his general health and activity, begins to lose appetite, to find a marked decline in his strength, and to get pale and thin, it shows the disease has extended to the air cells, and requires instant attention lest it should go on to consump-

tion. The chance of recovery is better in one having an hereditary tendency to consumption than in a person of strong constitution in whom it has been acquired, *if they have both the same extent and stage of disease*. Consumption was long regarded as incurable, but now it is regarded as a curable disease, though not easily cured.

Though patients may occasionally be able to ascribe the first occurrence of symptoms to a definite cause, yet far more frequently the exciting cause, such as exposure to cold, as well as the first symptoms, are alike obscure. A slight cough, more annoying by its continuance than its severity, and often called by the patients themselves an irritating cough, languor, slight wasting, easily induced fatigue, and a tendency to night-perspirations, are among the earliest symptoms which draw attention. That feeble, ill-nourished people should be in far greater danger of becoming consumptive than strong, vigorous, well-nourished persons is what we should expect. In such feeble, ill-nourished persons every cell and tissue is also weak and less capable of resisting disease, the whole being made up of its parts; but the weakest part, and hence the part most liable to disease, varies at different periods of life. During childhood they are more liable to croup, affections of the head, and moist eruptions on the skin; after puberty, to inflammations and bleeding from the lungs. Such persons are said to be sickly, that is, are more liable to disease, and do not recover so quickly from its attacks. Their flesh does not heal, a trifling wound being apt to be followed by severe irritation and copious suppuration of the wounded part, which is partly due to an increased irritability which accompanies constitutional weakness, and partly to the fact that weak or ill-nourished organs, when inflamed, show a great tendency to a copious

formation of cells of a weak and perishable nature, each cell taking after its parent cell, just as weakly parents have weakly children. When this occurs on free surfaces, such as external wounds, a copious flow of pus is the result. (Pus may be formed by irritants weakening the part, and by migration of white blood cells through the walls of the small vessels.) When the formation of cells occurs in a confined space, as in the substance of the lung, the mutual pressure of the numerous cells destroys their vitality, and they undergo fatty degeneration, the mass breaking down and forming a cavity. In scrofulous persons very trifling irritants, or mild inflammation, suffice to excite the glands into an active formation of new cells, which may not go on to inflammation and breaking down, but may stop with the consequent enlargement of the glands, or which may go on to inflammation from such slight causes that the inflammation appears to come on of itself spontaneously—for example, scrofulous ophthalmia, skin eruptions, etc. If this feeble power of resisting noxious agents has not subsided by the time the lungs become more especially liable to disease, the same trifling causes which formerly gave rise to ophthalmia, eruptions, etc., may now give rise to consumption.

There are certain physical appearances in those affected with consumption, and also in those having a constitutional tendency to it: these are a clubbed shape of the extremities of the fingers, with the nails curved downwards called filbert nails; a dilated state of the pupils of the eyes, a reddish or purplish line along the junction of the teeth and the gums, and the growth of hair down the back in the region of the spine.

The great predisposing cause of consumption is insufficient or improper food, and by food air is also meant; for though, unlike the fabled chameleon,

we do not live on air alone, yet, strange though it may seem, actually the greatest weight of food used is oxygen taken in by the lungs, as will be seen by the following rough calculation. A full-grown man doing no work requires on an average twenty-two ounces of food, weighed quite dry and free from water, that is, about forty ounces of solid food, in twenty-four hours, five ounces of which should be nitrogenous, three ounces of fats, and fourteen ounces of starches. This contains approximately nine and a half ounces of carbon, one and a quarter of hydrogen, eight of oxygen, and the remainder of nitrogen, mineral salts, and waste. One ounce is passed as solids in the stools, and one and three-quarters as solids in the urine; the rest, amounting to eleven ounces of water and thirty-four ounces of carbonic acid, requires about twenty-six ounces of oxygen for its formation, besides that contained in the food, and is excreted mainly by the lungs, the skin and kidneys helping to excrete the water produced along with that used in drinking. From this we may see the great importance of good ventilation and fresh air to all delicate and consumptive persons, though at the same time the air must be moderately dry and warm. We do not eat our ordinary food scalding hot or freezingly cold, so neither must we absorb our lung food in a condition to cause irritation.

Of food in the usual sense, the late Dr. Hughes Bennett pointed out that the proper nourishment and organisation of the body depend to a great extent on a proper proportion between the oily and albuminous principles of food being preserved, *and in consumption the oily food is deficient, while the albuminous is in excess.* He used to say that two of the main causes of consumption were the dearth of butter and the abundance of pastrycooks. For fat is an expensive article of diet, well-fed

meat being dearer than lean and badly-fed, and butter among poor families is replaced by molasses or jam; hence among the lower classes both children and adults suffer because they are unable to obtain a sufficient proportion of fat in their food; while pastrycooks cause consumption among young girls by disordering their digestion with puff-paste and the like, thus spoiling their appetite for food, especially fat food, which they might obtain in abundance if they liked. (See an article on "The Use and Administration of Fat," in *The Practitioner*, March, 1878.) It is well known that many workers using oil, such as in woollen mills, olive-crushing, natives of Iceland, who use oil freely as food, and many others, are almost totally exempt from consumption, though the dust in the woollen mills and the cold of Iceland would seem powerful exciting causes.

Another cause, the action of which is more difficult to explain, is dampness of the soil, low-lying damp situations being notoriously productive of consumption. Long-continued inhalation of dust acting as an irritant produces its own special form of consumption, fibroid or cirrhosis.

Treatment.—Delicate children of weakly or consumptive parents should not be nursed by the mother, and still less should they be fed on pap, but a vigorous wet nurse should be procured, or if this is impossible let them be fed with good cow's milk, failing which tinned milk should be used. If the milk is vomited, one spoonful of soda-water or lime-water should be added to three of milk. Milk is a natural emulsion of fat, and generally is the most easily taken of all fats. Fresh cream, with its own bulk of finely-grated biscuit, and one teaspoonful of brandy to two tablespoonsful of the mixture, can sometimes be retained when all other food is rejected. Children of consumptive parents

should use a daily tepid sponging, preferably with salt water; they should never be kept long at sedentary occupations, and should have plenty of gentle outdoor exercise, avoiding very cold and wet weather, and above all they should have a sufficiency of fat in their food. Occasional doses of cod-liver oil will not make up for the want of this, any more than a super-abundant meal once a month makes up for the want of a daily dinner. Fat meat must not be given in lumps, but mixed up with bread or potato. (See INDIGESTION, p. 289.) When consumption has actually begun there is no one remedy of equal virtue with cod-liver oil, which seems to have a special medicinal value, apart from its acting as food and strengthening the weakened cells and tissues, and when given in time along with proper attention to ventilation, warmth, exercise, and general habits, it usually prevents a threatened attack, and cures the earlier stages; sometimes also pretty far advanced consumption can be stopped by its use; if an attack of bronchitis does not diminish, as soon as considerable fever begins in the evening, all occupation must be given up, and strict rest with moderate warmth, 65° Fabr., used. A mustard poultice applied to the top of the chest till the skin is reddened, every second day. If the fever should still continue, 4 grains compound ipecacuanha powder, 2 grains of quinine, and 10 drops of tincture of digitalis thrice a day, with a teaspoonful of cod-liver oil, an hour after dinner and breakfast. When the disease has become chronic, or is chronic from the first, 2 grains of quinine, 10 drops dilute sulphuric acid and two tablespoonsful of infusion of calumba twice a day. A teaspoonful gradually increasing to a tablespoonful of cod-liver oil twice a day, an hour after breakfast and dinner. If it agrees with the patient, light bitter beer with

his meals. Milk and soda-water for drink—one of soda-water to two of milk—to be taken as often and as freely as possible. Mustard poultices the size of a common playing card to the top of the chest every second day, and left on till the skin is well reddened but not blistered. The chest may be rubbed with cod-liver oil when it disagrees with the stomach, for the skin absorbs a considerable proportion. Olive oil, almond oil, glycerine, and other oils are sometimes used when cod-liver oil cannot be taken. The complications of consumption are very numerous, and each must be treated for itself (see BLEEDING FROM THE LUNGS, INDIGESTION, DIARRHŒA, etc.), and in accordance with the general rules for consumption. Night sweats are checked by the sulphuric acid of the mixture recommended (p. 278). Cough may be relieved by half a drachm of ammoniated tincture of opium every four hours. Diarrhœa, by starch injection with 20 drops of laudanum. Spit, by inhaling cool vapour containing turpentine a teaspoonful to a cup of warm water. Irritable heart, by two drops of hydrocyanic acid in a spoonful of infusion of Virginian prunes. Finally, if the patient can be removed to an equable dry climate he should go at once, and next to it is an artificial climate in which the house is heated by a ventilating stove in the hall, and has an inner entrance door, by which means the heat is equalised, and there is no sudden change of temperature from draughts of cold air on opening the door. A stir was given in the treatment of consumption lately by Dr. Koch's method of injection; but the experience of nearly all the large hospitals of Great Britain does not bear out the favourable impression it first gave.

Pleurisy.—Inflammation of the Lining Membrane of the Lungs and Chest Cavity.—Like most inflammations, it may be acute or chronic, and may arise directly, as from cold, or be caused by

the blood-poisoning of some fever, such as scarlet fever. The varieties of pleurisy are :—

1st. Dry pleurisy, where there is no secretion from the inflamed membrane, and which gives rise to no symptoms unless there is extensive adhesion of the two surfaces of the membrane, when it may occasion slight breathlessness.

2nd. Pleurisy with scanty fibrino-serous effusion (common pleurisy), the exudation forming a soft false membrane on the surface of the pleuræ, and which glues them together in various places.

3rd. Pleurisy with abundant exudation.

4th. When the sac of the pleura becomes filled with pus (empyema), which is thin and contains curdy flakes in chronic cases.

Symptoms.—In pleurisy with scanty effusion, the disease begins with chilliness or shivering, followed by fever and a sharp piercing pain or stitch in the side, usually a little below and to the outside of the nipple. The pain is increased by breathing, coughing, sneezing. There is generally a short, harsh, dry, frequent cough, which the patient represses as much as possible from the pain it causes. The patient bends to the affected side and keeps his hand to it when coughing. The skin is hot and dry, the pulse quick and hard, the breathing short, cautious, and increased in frequency. A characteristic friction sound like the creaking of new leather may generally be heard at the seat of pain, and a rubbing sensation is sometimes felt by the patient, and may be felt by the hand laid over the place.

There is no rusty-coloured spit as in pneumonia, and the patient lies on the sound side.

Pleurisy with abundant effusion. The beginning symptoms are generally more severe, like pneumonia, severe shivering, high fever 101° to 105° F., headache, pains in the limbs, white tongue, stitch in the side, the pain of which is worst at one spot, and, together

with the friction sound, disappears as the effusion is poured out, breathlessness and rapid breathing, the patient lying on the affected side to give the sound side full play. As the disease advances the pain abates or disappears altogether. After six or eight days all the symptoms may undergo a marked decrease or cease altogether in a few hours, as in pneumonia, and the fluid poured out begins to be rapidly absorbed. In other cases the fever abates at the end of the first week or a little later, but the fluid poured out is only partially absorbed, and after a time there is a relapse with return of fever, cough, shortness of breath, and spitting of froth, and the disease may drag on for months with alternate partial recovery and relapses, and often terminates fatally.

It is sometimes difficult to distinguish pleurisy from pneumonia. The following are the points of difference :

1. Pleurisy seldom begins with a single violent chill or fit of shivering, while pneumonia usually does.
2. There is not usually such a sudden change for the better in pleurisy as there is in pneumonia.
3. In pneumonia there is a characteristic tenacious rusty-coloured spit; in pleurisy it is frothy and may contain streaks of blood.

Chronic Pleurisy.—May be left from acute attack or may come on insidiously, and may escape the patient's notice till he finds his strength beginning to fail with slight shortness of breath, and he becomes pale and thin with slight fever; the spaces between the ribs become lost from the bulging out of the muscles by the fluid, which may amount to several pints; such an effusion under the most favourable circumstances is very slowly absorbed, and is very apt to have relapses and finally to terminate in consumption, the lung becoming compressed and unable to expand when the pressure is removed. When pleurisy goes on to

the formation of pus (*empyema*), there is usually one or more strong shivering fits with an increase of the fever. The pus may open externally and cause a spontaneous cure, or into the lungs and be coughed up, usually unfavourable. Water on the chest (*hydro-thorax*) is commonly part of a general dropsy and affects both lungs, pleurisy usually affecting only one lung.

Air in the chest (*Pneumo-thorax*) occurs generally in consumption after some sudden exertion, such as coughing; the patient feels something tear, which is the rupturing of a small cavity, filling the sac of the pleura with air and giving rise to difficulty of breathing.

Treatment.—Perfect rest in bed, avoidance of talking or taking full breaths; if the pain is severe blood-letting by leeches, at the commencement of the attack only. A large hot poultice over the side for an hour, and then a fine flannel bandage round the ribs to prevent movement. 4 grains compound ipecacuanha powder every four hours while the pain continues, and then 10 drops tincture of digitalis, 1 grain of quinine, and 3 grains acetate of ammonia thrice a day, with a succession of blisters to the affected side, the blister to be removed when the skin shows signs of rising, and a new one applied whenever the skin is completely healed. In long-continued cases a daily spoonful of cod-liver oil with 3 grains iodide of potassium. When the fluid accumulates so as to threaten suffocation, it is let out by a hollow needle trocar plunged in between the seventh and eighth ribs, a little to the back of midway between the spine and breast-bone, and the needle sloping slightly upwards.

In empyema (formation of pus) a free incision into the side between the ribs at the lowest available part, with the insertion of a tube to allow the cavity to drain properly, is the best treatment.

CHAPTER VI.

DISEASES OF THE DIGESTIVE SYSTEM.

GROUP I.

AFFECTIONS OF THE THROAT AND GULLET.

Inflammation of the Mouth (Stomatitis).—Is a common disease in young children, and may occur in three forms according as the mucous follicles of the mouth (a follicle is a little recess of mucous membrane constituting a gland), or bladders of fluid, the gums, or the cheeks are attacked. 1. Vesicular or follicular. There is difficulty in sucking, abundant flow of saliva, loss of appetite, restlessness and fever, the glands under the chin are swollen and tender, and there is diarrhœa with offensive stools. Small vesicles form on the tongue and back of the throat which burst and form ulcers covered with dirty-white sloughs. 2. Ulcerative stomatitis, or *noma*, begins by white spots on the gum of the lower jaw ; there is heat of mouth, salivation, enlarged and tender glands under the chin, and the gums swollen and of a red or violet colour, covered by greyish matter. If the disease goes on the gums get destroyed by ulceration, the teeth become exposed and loosened, and the inside of the cheek becomes involved. 3. Cancrum oris : Gangrenous stomatitis. A hard red swelling begins on one cheek which spreads and opens into a shallow ulcer on the inside with a horribly fœtid

discharge. As the disease advances the cheeks and lips begin to swell, the breath is foetid, the flow of saliva is increased, the gums become affected and the teeth fall out, the glands beneath the chin are enlarged and tender, and finally the patient may die exhausted.

Treatment.—In the milder forms rhubarb and magnesia. Fifteen grains of rhubarb and 60 grains of carbonate of magnesia in an ounce of dill water, for a child a year old a teaspoonful every two hours till the bowels are moved. The mouth should be frequently moistened or the affected part painted with borax and honey. In the severer forms where there is ulceration, as soon as the red spot on the cheek is seen, chlorate of potash should be given 5 grains every four hours in sweetened tea for a week, and half a grain of quinine in a tablespoonful of infusion of calumba three daily for three weeks. When the disease has gone on to ulceration the edge of the wound should be touched with nitrate of silver, and the mouth frequently gargled with permanganate of potash, a teaspoonful to two wineglassfuls of warm water, to remove the smell. The diet should consist largely of milk, which may be supplemented with beef tea and eggs. Cod-liver oil, a tablespoonful daily for a child six years of age, to be taken an hour after dinner. During convalescence, if possible, change of air and a preparation of iron, such as 10 drops of the syrup of the iodide of iron in a tablespoonful of infusion of calumba.

Toothache.—A tooth consists of a hollow central cavity filled with pulp of connective tissue, nerves, and vessels; the body of the tooth is composed of ivory or dentine, and has an outside casing of enamel above the gum and common bone below.

Toothache may occur from softening and decay of the dentine, which causes great pain when it reaches the pulp. The cause may be hereditary constitution,

continued use of acids without washing the mouth after each dose, or of mercury, or indigestion.

Treatment.—Removal of the decayed portion and stopping: a temporary one may be made of cotton wool dipped in mastic varnish. A good temporary treatment is a smart purgative.

Toothache from inflammation of the pulp may occur from irritation of food or of hot or cold liquids when the pulp is bare. It may also occur by reflex action, from cold to the feet.

Treatment.—If the pulp is bare, a drop of carbolic acid on a glass rod or piece of wood to be applied to the pulp, a piece of cotton soaked in creasote, oil of cloves, or almost any essential oil applied to the pulp. Where there is no cavity a hot foot-bath and a purgative.

Toothache from decay of the fangs causes frequent abscess and thickening.

Treatment.—Have it extracted.

Toothache from neuralgia. A draehm and a half compound rhubarb powder, a small mustard poultice the size of a penny over the affected spot on the cheek, 6 grains of quinine in a glass of sherry. Sometimes a shilling on one side and a small piece of zinc on the other side of the tooth gives relief by the galvanic action.

Gumboil.—Is generally due to a decayed tooth and is most frequent in the upper gum.

Treatment.—Two teaspoonsful of cream of tartar, hot poultices to the cheek; if the pain is excessive a leech to the cheek; opening the boil when it is ripe, which is known by its shiny swollen appearance projecting at the side of the teeth.

Affections of the Tongue.—1. *Inflammation of the Tongue* (Glossitis) is a rare disease. There is pain, heat, salivation, and fever. The tongue is dark red, and may be covered with a thick slimy mucus.

Treatment.—The bowels should be freely opened by castor oil: if there is much swelling, incisions along the top of the tongue to relieve the swelling.

2. *Cracked Tongue.*—Generally from indigestion; there may be several cracks along the upper surface of the tongue, rendering eating and speaking painful.

Treatment.—Borax and honey frequently applied to the tongue, and any cause of ill health properly treated.

3. *Ranula.*—A semi-transparent swelling under the tongue, containing a glairy fluid, due to obstruction of the salivary duct from the gland under the chin.

Treatment.—Excision of a part of the wall of the swelling by a surgeon.

4. *Ulcers of the Tongue.*—There are several varieties, most of which are very painful and difficult to heal, and occasionally may be the beginning of grave disease of a cancerous nature. The whole of the top of the tongue may be superficially ulcerated in exhausting disease or long-continued indigestion.

Treatment.—Borax and honey frequently applied to the tongue, half a grain of quinine in a tablespoonful of infusion of ealumba thrice daily.

Ulcers the result of simple inflammation are usually small, superficial, very sensitive, and near the top of the tongue.

Treatment.—Milk diet, borax and honey, and occasionally, say every third day, 30 grains of compound rhubarb powder. Extraction of any teeth that may be causing irritation.

Scrofulous and syphilitic ulcers require to be treated for the cause—generally iodide of potassium, 3 grains daily, is of use.

Quinsy: Tonsillitis.—Is an acute inflammation of the tonsils (glands in the throat, one on each side of the uvula) which may or may not lead to suppuration. It is most frequently caused by

exposure to cold. Some people are much more liable to quinsy than others, and a person who has had one attack rarely escapes another, the liability to quinsy being increased by repeated attacks. It is rare in children, and is chiefly confined to youth and middle life, especially in adults with enlarged tonsils, and prevails most in spring and autumn. The inflammation is usually preceded for some hours by chilliness and fever, succeeded by a soreness in the throat and some difficulty in swallowing. The patient feels as if there was a foreign body in the throat ; hence he makes constant attempts to swallow, though the motion increases the pain. The symptoms rapidly increase, swallowing causing great pain, and on attempting to drink liquids they are returned through the nostrils. There is a continuous dull aching when the throat is at rest, the voice becomes nasal, and the patient can hardly breathe except through the nose. There is usually a constant flow of saliva, and there may be carache, or a piercing pain extending to the ear accompanied by deafness, from the inflammation involving the Eustachian tube, which leads from the top of the throat at the back of the nose to the inner cavity of the ear inside the drum. The mouth can only be partly opened, and that with pain and difficulty ; the tongue is thickly coated, and the odour offensive. Externally there is a painful swelling behind and below the angle of the lower jaw. These symptoms, along with loss of appetite, fever, and headache, go on increasing till the inflammation subsides or the pus escapes. The fever and prostration are quite out of proportion to the severity of the local affection. The temperature may be 104° Fahr. or more, and there may be sleeplessness or even delirium. When the abscess opens the pus may be swallowed, and the patient perceive it only by the sudden relief of all the symptoms. The attack generally subsides in a week.

and rarely lasts a fortnight. If suppuration has once occurred, future attacks rarely stop short of it.

Treatment.—Two drachms compound rhubarb powder at the commencement. A tablespoonful guaiac mixture, and two drops of laudanum every two hours, hot poultices to the throat, inhalation of steam, gargles of permanganate of potash solution. If near a surgeon the abscess may be opened, but it is dangerous to attempt it without knowledge of the part.

Chronic Inflammation and Enlargement of the Tonsils.—May result from quinsy or come on gradually, chiefly in serofulous children and women, causing deafness, thickness of speech, difficulty of swallowing, and hindering the breathing, or may cause cough.

Treatment.—Cod-liver oil. Gargles of tannic acid, 3 grains to an ounce of water, painting with nitrate of silver solution 4 grains to the ounce, iodide of potassium 3 grains twice a day for a week to a fortnight. If these remedies fail, part of the glands may be cut off by a surgeon.

Inflammation of the Throat (Pharyngitis).—May be acute or chronic. Acute inflammation is comparatively rare, and is usually accompanied by considerable swelling. The symptoms are fever, dryness of the throat, at first great pain and difficulty in swallowing, and there may be more or less difficulty in breathing, the voice become nasal, the patient speaking through his nose and becoming unable to pronounce the letter R from swelling of the uvula. The tongue is coated, the breath foul, the mouth has a bad taste and is full of saliva; there may be deafness and piercing pain extending to the ears.

In very severe cases food may stick after getting to the root of the tongue, the patient being unable to pass it either backwards or forwards, from the

inflammation paralysing the muscles of the throat. The affection is attended with great and rapidly increasing prostration, but usually terminates in recovery in a few days.

Treatment.—Hot poultices externally, inhalation of steam, chlorate of potash lozenges, one every half-hour.

Inflammation of the Gullet (Esophagitis).—Is generally from wounds or irritating substances. There is fever, burning pain shooting from the throat to the shoulder, difficulty in swallowing, coughing, and constipation. Treatment consists in applying hot fomentations to the throat, rest, even talking being forbidden, aperient injections, such as castor oil and gruel, milk and cream and demulcent fluids, such as barley water. Stricture of the œsophagus requires surgical treatment.

GROUP II.

AFFECTIONS OF THE STOMACH.

Indigestion or Dyspepsia.—Faulty digestion is one of the most common of all ailments, and though rarely causing direct danger to life, it is a source of discomfort which often renders life a burden.

The predisposition to indigestion varies with the individual, and even in the same person it varies according to his general health. In some persons it is induced by causes which would have no effect on others. In many there is an hereditary tendency to indigestion, and in all one attack renders the patient more liable to another.

We shall first consider the natural process of digestion in order to have a better understanding of the causes of faulty digestion.

All kinds of food may be divided into four classes:—

1. Nitrogenous, principally albumen, fibrin, and

casein, albumen being largely present in the juices of almost all vegetables, in eggs and flesh ; fibrin or gluten in corn and seeds and in flesh ; casein in peas, potatoes, etc., and the cheese of milk.

2. Fatty, comprising animal fats and oils.

3. Farinaceous, starch, gum, and sugar, which are readily converted into fat.

4. Mineral salts, chiefly phosphate of lime and common salt. Water, which constitutes four-fifths of the weight of the body, and air are both necessary for existence, but are not food in the usual sense.

To preserve life and health there must be a due proportion of food from each of the groups. No number of substances belonging to one group will preserve life ; thus dogs fed on starch, sugar, gum, butter, and oil died in a little more than a month. A diet of white bread and gelatin, with water, produces death from starvation, but a little brown soup added renders it highly nourishing, showing that one substance, even though containing principles of the four groups, does not preserve life.

The typical food, milk, which is the only substance on which it is possible to maintain life and health alone, contains nitrogenous matter in the cheese, fatty in the butter contained in it, and mineral salts in the whey.

The natural instinct of our appetites has arranged the different articles of food in the most scientific manner ; thus, ham and fowl, bacon and beans, potatoes and beef, bread and butter ; the nitrogenous principles of the one being balanced by the fat of the other.

An able-bodied working man requires about 35 ounces of dry nutritious food daily, forming about six to seven pounds of mixed solid and liquid. Food should be well cooked and varied, the flavours exciting the flow of saliva and digestive juices, thus rendering it more digestible.

Digestion.—In the mouth the food when chewed is mixed with the saliva, which assists in breaking it down and facilitates swallowing by moistening the food, besides which it has a chemical action changing starch into sugar by an active principle called ptyalin. Probably none of the secretions is more easily influenced by the emotions than the saliva; even the thought of a feast makes the mouth water, while dryness of the mouth is a symptom of terror or anxiety.

In India a thief is detected by making him chew rice; the saliva will not flow from fear, "for conscience doth make cowards of us all," and so the grain remains dry. Bolting the food, besides leaving it in masses, excites less saliva, and hence causes undue labour to the stomach. The action of chewing, pleasant emotions and flavours of food, all excite the flow of saliva; hence food should be well cooked and eaten slowly in pleasant company. After the food has reached the root of the tongue it is beyond the power of the will, and is carried to the stomach by a continuous wave of motion in the gullet. The stomach is a bag which lies across the body and holds about five pints in an adult man. It is composed of a mucous coat internally, a muscular coat in the middle, and a serous coat outside.

When the food arrives in the stomach it is pushed from left to right along the lower and longer border of the stomach, and then from right to left along the upper and shorter border.

This circulating movement continues till the food is broken down into a fine pulp, of a strong acid taste and smell, called chyme, when it passes out into the bowels. During digestion the stomach is very irritable, and remains firmly closed, so that nothing but the finest pulp can pass out; but after digestion is over undigested masses of food, and even large bodies such as coins, can pass through.

The membrane of the stomach contains numerous small glands, which secrete an acid fluid, the gastric juice, the active principle of which is called pepsin, and has a powerful dissolving action on the nitrogenous parts of food, but merely liquefies the fat. As soon as a part of the food is digested, it passes out of the stomach, leaving the rest freely exposed to the gastric juice. The digestive action of pepsin goes on out of the body in a vessel kept at 100° F., but takes three times as long, from want of the muscular movements, to break down and mix the food, and the dissolved parts remaining to hinder the action on the remainder of the food.

The blood vessels of the stomach absorb directly liquids and anything dissolved in them such as salt or sugar, but not things merely mixed or suspended in the fluid; for example, the water of soups is absorbed directly by the vessels, leaving the thick residue to be acted on by the gastric juice, and firm enough to be affected by the movements of the stomach, which, after absorbing the fluids, prepares the solids for the bowels, where the digestible portion of them is absorbed. When the fluid chyme leaves the stomach, it becomes mixed with bile from the liver, which arrests the action of the gastric juice, so that if any bile gets back into the stomach it arrests digestion and causes bilious vomiting. The bile acts as a natural purgative and antiseptic, besides helping the absorption of fat. The pancreas or sweetbread adds a fluid the active principle of which, pancreatine, breaks up fat into an emulsion (cream is an emulsion of butter), and allows it to become absorbed by the lacteals. The small bowel is lined inside by numerous villi, which are small projections shaped like the finger of a glove, and each of which contains minute blood vessels, and one or more lacteals or digestive vessels. The blood vessels absorb everything in-

diseriminately which can enter through their walls, but the lacteals select their materials, refusing to absorb many things which are taken up by the blood vessels. The muscular contraction of the bowels forces the food against the villi containing lacteals and blood vessels by which it is absorbed. There are also various glands in the bowels which secrete a small amount of juice which helps to finish digestion. The fluid in the digestive vessels at first somewhat resembles milk and is called chyle, which after passing through several glands gradually becomes like blood, and is finally passed into the blood by the main trunk of the digestive vessels or thoracic duct. All the various processes are necessary to and assist one another. The saliva when swallowed stimulates the secretion of gastric juice, and this in turn stimulates the flow of bile, pancreatic and intestinal juice. The conditions favourable to digestion are a moderate quantity of food, the stomach free of the last meal, tranquil state of mind, and good bodily health. Indigestion may be caused by anything which disturbs the natural balance of the different actions.

The causes of indigestion are very various, and it is often difficult to tell whether a given symptom is a cause or an effect; for example, mental depression causes indigestion, while indigestion almost always causes low spirits. The symptoms of indigestion may be due to chronic inflammation of the stomach (acute inflammation is not reckoned), or to irritation which may or may not lead to inflammation. The principal causes, remembering that there may be more than one cause, may be arranged as follows:—

1. *Scanty Gastric Juice*.—The chief evil of deficient gastric juice is not that some of the food gives no nourishment, but that fermentative changes take place, and cause irritation of the stomach, and

the gases evolved cause distension of the walls, thus hindering the muscular movements and aggravating the evil. Fermentation and putrefaction, it is well known, occur much more rapidly in closed vessels at a uniform moderate temperature, both of which conditions are realised in the stomach. It is probable that there are thousands of different organisms (germs) which in their growth cause the different putrefactive and fermentative changes; each one always causing the same effect, at any rate in the same kind of substance, and that the different odours and changes in putrefaction vary according to the presence or absence of some of them. Familiar examples are seen in various ferments, such as yeast, and vinegar, and in sour milk; yeast added to a solution of sugar or starch invariably produces alcohol, vinegar produces vinegar, and a small quantity of sour milk turns gallons sour; the organism in these cases is known, and the resulting changes can be certainly predicted. The presence of organisms cannot in all cases be inferred with certainty from such changes alone, there being a remarkable class of chemical bodies which have the power of causing changes in other substances without themselves undergoing decomposition: this is termed catalytic action; but it differs from the vital action of germs in the important point that the substance does not itself increase; hence if we take a little of the first solution and add it to fresh quantity of the material operated on, the change takes place much more slowly, and by repeating the process the effect rapidly reaches a vanishing point where no perceptible action takes place, while with the vital action of germs, which reproduce themselves, the change in the last solution takes place as quickly as in the first. The gastric juice is a powerful natural antiseptic, *i.e.*, destroys and prevents the growth of organisms, as well as

acting chemically on the food; hence, when it is deficient or too dilute, fermentation is possible and generally takes place. The deficiency may be due to (a) fevers and acute inflammations, such as pneumonia, probably owing to the amount of water lost by the skin and lungs, causing less juice to be secreted, and which led to the erroneous maxim "Starve a fever;" the proper treatment being to feed a fever with digestible food in small quantities at a time, so that less juice is required, and the food is quickly changed, preventing fermentation and indigestion. In scarlet fever, and also in small-pox, measles, and perhaps some other fevers, the peptic glands of the stomach become inflamed, and hence the supply of gastric juice becomes lessened.

(b) Bloodlessness and general debility. All the fluids of the body are deteriorated, and the gastric juice participates in the deterioration, being deficient in the active principle pepsin. For this reason people in ill health, or weakly people, especially children, are unable to digest the food which is easily taken by and of benefit to those in good health. (Treatment by pepsin.)

(c) Too much food taken at a time, which is the same in effect as a deficient supply of gastric juice. This is most frequently seen in infants, though adults also take more than enough, especially at public dinners, and generally suffer from indigestion next day in consequence. Infants will almost always take nourishment as often as it is given them, hence when the supply of milk is abundant they generally drink till the stomach is over-filled. If they vomit readily the surplus is removed, and they readily digest and thrive on what remains. If they do not vomit readily the stomach remains over-filled, causing indigestion.

(d) Food which is beginning to decompose. Where there is powerful digestion there may be enough

gastric juice and muscular action to dissolve the food quickly and check the progress of putrefaction; thorough cooking also, by killing most of the germs, allows the stomach a fair start; hence high game when well cooked is actually more digestible, provided no irritant chemical products are evolved, part of the dissolving action being already done. The most common source of mischief from this cause is in rearing children by hand. A child that is suckled obtains its milk free from germs except such as may be in its mouth, so the stomach has an opportunity of digesting the milk before germ changes take place; but with a child reared by hand, as a rule the milk has had abundant opportunity to get filled with germs, often with the special germs which grow most quickly and vigorously in milk. The food, being generally kept in a warm room, is at the temperature most favourable to germ growth, and the smallest trace of the former supply of milk which has turned sour, either in the bottle or in the child's mouth, is sufficient to cause rapid fermentation. We know how carefully dairy-keepers scald and cleanse their milk pans, especially in hot weather, to prevent the milk spoiling, yet how few mothers or nurses are equally diligent in cleansing the feeding-bottle and wiping out the mouth of their charges, though, as before mentioned, a vigorous child may thrive despite of considerable carelessness, merely because it takes a great deal of killing. The special germ which causes sour milk (*bacterium lactis*) has been shown by the ingenious experiments of Professor Lister to be comparatively rare in the atmosphere, although if once added to milk it acts both speedily and certainly.

2. *Insufficient Division of Food.*—The gastric juice may be normal or even increased in amount, but from the food being hard and indigestible, or from deficiency of muscular movements,

the juice is unable to penetrate and dissolve the food, the centre parts of which may decompose, causing the usual fermentation changes, or the food may lie unchanged, feeling as a heavy weight at the stomach from direct irritation.

(a) Swallowing the food insufficiently chewed, either from bolting the food or from want of teeth. Consequently the larger masses offer little surface for the gastric juice to act on, and while the outside of the mass may be digested the inside is untouched and ferments. From this we see the importance of preserving the teeth and eating slowly. The teeth should be brushed *at least* once a day, clearing away the minute particles of food which get lodged in the interstices and otherwise undergo fermentative changes leading to the decay and destruction of the teeth; much as mites destroy cheese. One of the best tooth powders is ponderous magnesia, which is a soft mild alkali and may be scented and flavoured to taste. Vegetable food requires more ptyalin to convert the starch into sugar than animal food does, and hence requires more chewing. Swallowing masses of fat or in a form in which when melted it can run together, hinders digestion, and the acrid matters produced cause great irritation, to prevent which fat should be given finely divided, a familiar example of which is seen in bread and butter. If the butter were taken alone it would almost certainly cause sickness, while along with bread it is comparatively easily digested, the bread crumb preventing its running together in the stomach and causing it to present a very large surface for the action of the gastric juice. In the same way fat meat or gravy should be mashed up with potato or bread (Dr. Lauder Brunton, on the "Administration of Fat," in the *Practitioner*, March 1878).

(b) Too much liquid at meal times dilutes the

gastric juice, rendering its action slower, and impairs the muscular movements by over-distension.

(c) Deficient muscular action from any causes lessens the digestive power. The food is no longer rubbed down mechanically nor the outer part rubbed off when softened, thus exposing a fresh surface to the gastric juice; hence the juice accumulates from want of sufficient surface to use it all, and acting as an irritant to the stomach, it causes vomiting, in which it is thrown up along with the almost unaltered food. This is the chief cause of the indigestion generally following full doses of narcotic remedies such as opium, chloral, chloroform, etc., and in a less degree arising even from smoking tobacco.

3. *Faulty Innervation*.—(a) Deficient nervous energy. If after a full meal we at once begin severe mental or physical work, the nervous energy is diverted from the stomach to the brain or muscles, thus slowing the muscular movements of the stomach, and similarly the blood supply is also diverted, causing a scanty secretion of gastric juice. For the same reason continued mental depression, long-continued night-watching, severe exhaustion, or sudden mental excitement, as great joy or grief, diminish the secretions and destroy appetite.

(b) Slow digestion. May be due to a naturally small supply of blood causing a scanty secretion of gastric juice, or to deficient muscular action from relaxed feeble state of the muscular fibres.

(c) Reflex disturbance of the nervous supply may occur from disease of the brain, womb, or liver.

(d) Neuralgia of the nerves of the stomach may also occur, hindering the muscular movements and the secretion of gastric juice.

4. *Chronic Inflammation*.—The preceding causes are generally in the first instance unaccompanied by inflammation of the stomach and may never go on to it.

The succeeding causes produce chronic inflammation of the stomach (chronic gastritis), the prominent symptoms of which are those of indigestion, and which may be the cause or the consequence of the inflammation; for acute inflammation see GASTRITIS and BILIOUSNESS.

(a) Direct irritation of the mucous membrane of the stomach leading to chronic inflammation greatly diminishes the secretion of gastric juice, and if severe also impedes the muscular movements both by direct action on the muscles, and by deranging the nervous supply. The most usual forms of irritation are from abuse of spirits, very hot or cold drinks, strong medicines, immoderate use of condiments such as pickles, pepper, spices, hot sauces, or highly-salted food such as salt ham.

(b) Over-secretion of gastric juice, the surplus acting as a direct irritant to the stomach. (Rare.)

(c) Secondary to disease of the heart, lungs, liver or kidneys, the mucous membrane of the stomach becoming gorged or congested from mechanical arrest of the circulation; carbonic acid accumulates in the blood, and the gorged vessels cannot absorb fluid from the stomach, nor the gastric glands secrete juice from want of fresh blood to supply them; after a time the part, becoming weakened and irritated by fermentative changes, gets into a state of chronic inflammation.

(d) Secondary to diseases and affections of the bowels and digesting glands, such as constipation, congestion of the liver, obstruction of the bowels, etc.

Symptoms.—Vary considerably both in nature and severity, according to the cause of indigestion, and even from the same cause. (1) When the cause is scanty secretion of gastric juice, there is prolonged distress after eating, a feeling of weight and uneasiness at the pit of the stomach, flatulence and evolution of gases (CARMINATIVES, p. 458), sour

eructations, irregular action of the bowels, and some of the food passes unchanged.

(2) If the cause is indigestible food or weakened movements of the stomach, in addition to the symptoms already mentioned, there is generally a great tendency to vomiting and heartburn, which is eructation of a watery acid or insipid fluid, and which may be accompanied by pain of a burning kind (relieved by alkalies).

(3) When due to faulty nervous supply, the pain is often severe and is relieved by pressure, and is not unfrequently accompanied by severe headache over the eyes and palpitation of the heart.

(4) When due to chronic inflammation (gastritis), there is headache and a feeling of tightness across the forehead, flashes before the eyes, pain and swelling of the stomach, along with a feeling of sickness, but which does not generally go on to vomiting, heartburn and eructation of gases. The tongue is usually red at the tip and edges, coated with a creamy white fur, and the breath offensive, having a peculiar odour of phosphorus. The pain in the stomach is often momentarily relieved by eating, hence there may be a voracious appetite. The mental depression is generally greater than in other forms of indigestion, and when long continued there is generally redness of the tip of the nose.

In all forms of indigestion there is more or less mental depression, headache, giddiness, and palpitation of the heart, along with disturbed sleep, fearful dreams or nightmare, loss of appetite, flatulence, and often nervous pains in the head, limbs or chest, a bitter or slimy taste in the mouth, and after long continuance there may be more or less emaciation.

As a rule the tongue shows the state of the stomach, becoming furred and causing bad taste in the mouth, along with an offensive odour, when the mucous membrane of the stomach is disordered;

the state of inflammation probably extending up the membrane of the gullet to the tongue. A less obvious connection exists between the state of the stomach and the skin of the tip of the nose; in many persons increased irritation and inflammation of the stomach is unfailingly shown by increased redness of the nose. Old toppers whose stomachs are in a state of chronic inflammation from constant irritation of spirituous liquors have generally, according to the song, "a jolly red nose," the colour varying from a bright red to a purplish tint. Sometimes the irritation causes nervous cough.

The urine is generally high-coloured, and deposits a reddish sediment (urates).

Indigestion is rarely fatal, but is often of very long continuance, especially chronic inflammation.

Treatment.—The food should be of the most easily digestible kind and given in rather small quantities at a time, spread evenly over the waking hours. It should be very thoroughly chewed, both to break it down and to increase the flow of saliva. If the teeth are lost, false teeth should be inserted, or a knife with four blades set in a handle may be used, which by two cross cuts makes twenty-five pieces.

It must be remembered that food may be very easily digested and yet contain but little nourishment, while indigestible food may be very nourishing when absorbed. Old people should have food that is easily soluble, because the juices and movements are lessened. The general health must be attended to that a sufficient supply of nervous energy may be available. There must be rest from business or severe studies, exercise in the open air, cold bathing in suitable cases, or a wet compress over the stomach consisting of four folds of linen wrung out of cold water and covered with a dry cloth and piece of waterproof; the reaction when it warms draws blood to the stomach, and increases the supply of secre-

tions. In indigestion from scanty gastric juice a moderate allowance of wine or weak brandy and water, one tablespoonful to a tumbler of water, is of use, alcohol being both a stimulant to the secreting glands and an antiseptic. In convalescence from fevers, and in general bloodlessness, light bitter beer is to be preferred. A tablespoonful of infusion of calumba with 12 grains of compound rhubarb powder is to be taken twice a day, an hour before meals. Pepsin may be taken before the meals, 3 to 6 grains at a time, to supply artificial gastric juice, particularly in fevers, where as much as 15 to 20 grains a day may be given. Meat and eggs should not be over-cooked, but just beginning to be done. Alkalies may be taken to cause more of the digestion to be done in the bowels; a tumblerful of equal parts milk and lime-water, or a glass of soda-water alternating every week with potash-water, after dinner. If the bile is also deficient, which is shown by clay-coloured stools, 2 to 6 grains of ox-gall, to which may also be added 3 to 6 grains of pancreatine.

When indigestion proceeds from errors in diet, bolting the food, too much food or drink, narcotic medicines, or smoking, these conditions must be altered, when it will probably stop of itself. Deficient muscular movements require the same treatment as slow digestion.

When indigestion proceeds from deficient nervous energy, attention to the general health, rest after meals, and a moderate amount of wine or dilute spirits; when from slow digestion, which is very common after middle age, a tablespoonful of spirits in a tumbler of water, and the following tonic in pill—1 grain extract of aloes, 2 grains pepsin, $\frac{1}{4}$ grain of strychnine—to be taken every day half an hour before dinner.

In painful digestion 8 grains of subnitrate of bis-

mouth with 2 drops of dilute hydrocyanic acid twice a day.

In all the foregoing forms of indigestion where there is much acid eructation, charcoal 12 grains at a time, and a daily globule of ereasote, half an hour after dinner, may give great relief.

Acid indigestion felt about two hours after meals is relieved by alkalies such as soda.

When indigestion is due to over-secretion of gastric juice, which is rare, a daily dose of 2 to 6 grains of ox-gall and a tumbler of soda-water will suffice to correct it.

Indigestion from chronic inflammation of the membrane of the stomach is made worse by the use of wine or spirits. The food must be sparing and easily digested, avoiding all seasoning except a small amount of salt. Thirst may be relieved by sucking small pieces of ice. Strong tea and coffee, which are frequent causes of this form of indigestion, must be avoided, and a glass of *boiled* milk, which may have a third part of soda- or potash-water added to it, used instead. 12 grains of sub-nitrate of bismuth twice a day. Occasionally a mustard poultice over the stomach every third day till the skin is reddened, and a cold compress alternate days continued for a week at a time. Half an ounce each of compound decoction of aloes and compound infusion of gentian, along with 4 grains of bicarbonate of soda; to be taken half an hour before dinner, and if there is constipation, it may be taken twice or even three times a day: to be taken alternate weeks. Of ordinary animal food, beef and mutton are the most nourishing, and when well cooked, particularly roasted, are as digestible as any other. Roast is more digestible than boiled meat, and stewed is less so than either. It is easier for the stomach to digest a few different articles than to be restricted to the same amount

of one. A little soup, white fish, and roast meat is better than if the dinner had consisted of the same amount of beefsteak only. Of raw fruits oranges and grapes, and of vegetables asparagus and cauliflower, are most easily taken. Light puddings are a wholesome and digestible addition to dinner, but pastry, dumplings, cheese, beer, port wine, and raw spirits are all to be avoided. By long custom a power may be acquired of digesting substances which at first could not be tolerated, and finally personal peculiarities or idiosyncrasies often have a great effect in rendering things digestible, indigestible, or even poisonous. I know a man who cannot eat eggs or potatoes without symptoms of poisoning.

Flannel should be worn next the skin both night and day, and damp feet guarded against.

The articles in the following list are arranged according to the order of their digestibility, the most digestible being placed first (taken from Dr. Chambers on Diet):—

Sweetbread and lambs' trotters.

Boiled chicken.

Venison.

Lightly boiled eggs, new toasted cheese.

Roast fowl, turkey, partridge, and pheasant.

Lamb, wild duck.

Oysters.

Omelette, tripe.

Boiled sole, haddock, skate, trout, perch, tripe, and chitterlings.

Mutton.

Roast beef.

Boiled beef.

Roast veal.

Boiled veal.

Salmon, mackerel, herring, pilchard, and sprat.

Hard boiled and fried eggs.

Wood pigeon, hare.

Tame pigeon, duck and goose.

Fried fish.

Roast and boiled pork.

Heart, liver, lights, milts and kidneys of ox, sheep, and swine.

Lobsters, shrimps, and prawns.

Smoked, dried, salt, and pickled fish.

Crab.

Ripe old cheese.

Inflammation of the Stomach. Acute and Sub-acute Gastritis.—*Acute* seldom arises of itself, but is generally due to irritant poisons, such as mineral acids, raw spirits, or boiling water. There is burning pain over the stomach, which is increased on pressure, and spreading downwards, distressing sickness, violent vomiting and retching, quick pulse and breathing, along with considerable fever.

Treatment.—Avoid emetics, give mucilaginous drinks, such as barley water and linseed tea, small quantities of ice milk and opiates, such as 20 drops of laudanum, every four hours if required during the first day. During convalescence, for a considerable time the food should consist solely of milk, and the various starches, corn-flour, arrow-root, grated biscuit, etc.

Sub-acute.—There is headache, sickness and vomiting, sensations of heat and cold, distaste for food; even the sight or smell of it may bring on vomiting, the vomited matters being streaked with blood.

There is more or less fever, hot skin and quick pulse, foul tongue coated with white fur, a clammy feeling of the mouth, offensive breath, and eructation of acid fluid and gases.

Treatment.—An emetic of ipecacuanha at the outset, rest, equal parts of soda-water and milk, when vomiting is severe with ice in it if preferred, given in small quantities at a time. After the vomiting ceases bland food, milk, corn-flour, gruel, etc., in small quantities, fomentations over the stomach as hot as the patient can bear. Ten grains of bicarbonate of soda with 10 grains of bismuth subnitrate, and 2 drops of dilute hydrocyanic acid every four hours. Small quantities of ice water, a teaspoonful at a time, or sucking pieces of ice to relieve the thirst.

Chronic Ulcer of the Stomach.—Is rare before puberty, and occurs twice as often in women as in men, and more frequently among the poor than those in good circumstances. It is most frequently found in women between eighteen and twenty-five years of age who are pale and comparatively bloodless. The ulcer is generally about the size of a shilling, round in shape, with sharp edges, and is caused by obstruction of a small blood vessel, leading to death of the parts it supplied with blood. It may prove fatal by perforating the stomach, the contents of which escape and cause fatal inflammation (peritonitis), or by loss of blood from the ulcer opening into a large blood vessel, or finally by exhaustion. The symptoms vary in severity in different cases. Two to ten minutes after taking food there is a feeling of weight or tightness at the pit of the stomach, which rapidly increases into a burning or gnawing pain, and which is increased by pressure and produces a sense of sickening depression. The pain lasts from half an hour to two hours, and is greater and lasts longer the larger and rougher the food, bread and potatoes causing longer and severer pain than milk and corn-flour. When the stomach is emptied by vomiting, which often occurs, the pain at once ceases. The tongue is generally red and furrowed, and acid eructations usually occur, accompanied by constipation and increased thirst.

The course of chronic ulcer is almost always tedious, running on for months or years, and relapses are not uncommon. In favourable cases the pain diminishes as the ulcer heals, and there is complete recovery, or the scar of the ulcer may cause stricture of the stomach, which causes more or less suffering after a full meal, heartburn and vomiting. The scar may become attached to some other organ and cause pain by interferin

with the movements of the stomach during digestion.

Treatment.—Rest to the stomach and soothing medicines. The food must be bland and taken in small quantities at a time. Iced milk with a quarter of its bulk of lime-water, a wineglassful at a time, small quantities of gruel, corn-flour, or grated biscuit. Twelve grains of subnitrate of bismuth every eight hours. In severe cases complete rest to the stomach. The patient should be nourished by injections of milk, beef tea, beaten-up eggs, and occasionally brandy; each injection must not exceed a small teacupful. Perfect rest lying down. Hot fomentations over the stomach. If the pain continues severe, 20 drops of laudanum in injection twice a day. Occasionally $\frac{1}{2}$ of a grain of morphia by the mouth during very severe pain. The injections may be continued for eight or nine days till the pain and irritability of the stomach cease. Great caution as to food is required during convalescence, and sugar, beer, wine, tea, and coffee must be avoided for some time.

Vomiting of Blood (Hæmatemesis).—Is generally from an ulcer opening into an artery or vein, but it may also occur from congestion caused by disease of the liver, heart, or lungs, or without any special cause. After sickness for a little time and a feeling of a warm fluid rising in the throat with a sweetish taste, there is violent vomiting of blood, partly fluid and partly clotted, usually of a dark brown colour and mixed with food.

Treatment.—Perfect rest lying down, cold over the stomach, swallowing small pieces of ice if procurable. Alum 12 grains (about the size of a small bean), along with 10 drops of dilute sulphuric acid, in a wineglassful of water, every half-hour if required. The patient must abstain from food for twenty-four hours, and must not rise to stool, but

use a bedpan. The food for some days must be cold or lukewarm, and consist chiefly of milk with one-third of lime-water. In the chronic form 12 grains of gallic acid every two hours if required.

Differences between Bleeding from the Lungs and from the Stomach.

Blood from the lungs.	From the stomach.
Difficult breathing, pain, or heat in the chest.	Sickness and burning heat at the stomach.
Blood coughed up in mouthfuls.	Blood vomited profusely.
Blood is bright red and frothy.	Blood is dark, mixed with food, and not frothy.
Blood rarely found in the stools.	Blood, black and tarry-looking, in the stools.

Cancer of the Stomach occurs more frequently in men than in women, and is rare before the fortieth year of age. Few survive beyond two years from the commencement of the symptoms. The symptoms are pain in the region of the stomach of a burning, cutting, or gnawing character, which is increased by food or by pressing over the stomach. There is frequent vomiting, more frequent the nearer the cancer is to either of the openings of the stomach, of a glairy mucus and altered blood having the appearance of coffee grounds. There is loss of appetite, sickness, and eructation of foul gases. Along with these symptoms the patient rapidly loses strength, and acquires a characteristic dirty-yellow colour of the face, and finally swelling of the ankles. The walls of the belly are retracted, and a firm painful tumour, the size of an egg to that of a fist, may be felt generally towards the left side, pulsating when it lies over the main artery (aorta).

Treatment.—Opiates to relieve the pain, a pill

of 1 grain of extract of opium, a quarter-grain of extract of belladonna, and 3 grains of extract of conium, may be taken every four hours if required. Subcutaneous injection of morphia ($\frac{1}{4}$ grain) is a very common remedy. If there are very acid or sour eructations, vegetable charcoal 16 grains as often as required. When the pain is also considerable, 12 grains each of subnitrate of bismuth and bicarbonate of soda and a glass of soda-water twice a day; occasionally nitrate of silver pills half-grain each, every four hours, give relief when other things fail (for evil effects see POISONS). Locally, hot fomentations over the stomach may give relief.

The food must be small in quantity, nutritious, bland, and digestible, milk, plain or with a quarter of lime-water, forming a large part.

GROUP III.

AFFECTIONS OF THE BOWELS.

Inflammation of the Bowels.—Inflammation very rarely affects the whole length of the bowels, and the farther it gets from the stomach the more apt is it to be affected. The inflammation varies very much in severity and in consequent symptoms.

When the inflammation is slight (CATARRH: see p. 238) and confined to the short part of the bowel (duodenum) near the stomach, it is often spoken of as a bilious attack, because there are vomiting and purging of bile, not because more bile is secreted, but it is not reabsorbed. When bile gets admission to the stomach it neutralises the gastric juice and stops digestion; the undigested food then acts as an irritant and causes vomiting.

It is usually accompanied by headache, with a dull heavy feeling in the head, chiefly in the forehead, over the eyes, and in the eyes themselves,

which are painful when pressed on or turned up, and are often slightly yellow. There is great languor and depression, sometimes giddiness, and a tendency to drowsiness and sleep which is not refreshing. There is usually nausea and sickness, and the attack often terminates by vomiting of green bile. The bowels are generally constipated. Many people suffer from repeated attacks, and such persons should use great caution in the matter of diet, avoiding pastry, stews, malt liquors, and any article of food which by experience is found to favour an attack: for example, if tea or coffee disagree, milk or cocoa may be tried.

Treatment.—Complete rest in a darkened room, with free ventilation, total abstinence from food and drink, except sucking small pieces of ice to relieve thirst and vomiting, and fresh oysters when they can be had. To relieve headache, 60 grains compound rhubarb (Gregory's) powder. If vomiting continues severe, a mustard poultice over the stomach. When the vomited matters are very acid, 12 grains of subnitrate of bismuth along with 12 grains of carbonate of magnesia in a tumbler of soda-water. The attack usually subsides in two to five days. As vomiting subsides small quantities oficed milk may be given, and other food given as the symptoms disappear. Biliousness from inability to digest food containing fat (of frequent occurrence), which is a very necessary part of diet, may be overcome by the use of pancreatine, 3 to 6 grains.

When the small bowel generally is affected (*enteritis*) there is pain, flatulence, and diarrhoea, at first of thin ordinary stools, but, after the bowel is emptied, of watery fluid secreted from the blood, just as a cold increases the secretion from the nose. The colour of the stools is usually green from bile, the action of the bowels being hastened and absorp-

tion hindered, so that the bile passes unaltered. When there is profuse diarrhœa the bile is unable to colour it all, hence the stools become gradually paler. Diarrhœa may be absent from the first owing to the reabsorption of the fluid by the larger bowel. Flatulence and rumbling in the intestines are caused by the gases from decomposing food or mucus, and are relieved by eructations. The pain is usually felt round the navel, is relieved by pressure, and subsides for a time just before and after a stool. As the inflammation increases the muscular fibres of the bowels are paralysed or impeded, causing obstinate constipation. There is also sickness and vomiting, the vomited matter gradually acquiring the offensive odour of the stools, accompanied by thirst, hot skin, anxious countenance, and fever which may go on to delirium.

Chronic inflammation in adults is rarely accompanied by diarrhœa, but usually by more or less constipation, the belly becoming tense and interfering with the circulation and breathing. The tough mucus secreted hinders nutrition, and by decomposing causes flatulence; hence in time the patient becomes weakened and emaciated.

Chronic inflammation in children shows itself as an obstinate and exhausting diarrhœa.

The causes of inflammation of the small bowel may be secondary to some disease of the liver or chief vein, heart or lungs, causing increased blood pressure (congestion) going on to inflammation. It may be direct from irritating purgatives or food, usually vegetable, or it may be reflex from sudden exposure of the skin to prolonged cold, or great heat as in extensive burns.

Inflammation of the lower bowel (*typhlitis*) is usually caused by accumulations of undigested food, such as skins and stones of fruit. The muscular fibres become paralysed, causing constipation;

mucus or blood and mucus passes at stool, but no proper evacuation. There is fever, sickness, and vomiting, with tenderness on the right side, greatly increased by pressure.

A sausage-shaped tumour can be felt between the right hip and lower ribs. The pain often extends down the thigh and is marked by severe paroxysms, with intervals of comparative ease. All these symptoms, although severe, may pass away after several lumps of hardened fæces have been passed.

In chronic inflammation the symptoms come on gradually, with failing health, weakness, loss of appetite, pains in the right side, and alternate diarrhoea and constipation.

Treatment.—For inflammation generally, when acute. Poultices of linseed meal with a little mustard frequently applied to the abdomen, a pill of 1 grain extract of opium and $\frac{1}{4}$ grain extract of belladonna, with 3 grains extract of conium, every eight hours if required, two teaspoonsful of castor oil, injection of a pint of gruel and a tablespoonful of castor oil; strong purgatives are pernicious, as the muscular fibres of the bowel are already paralysed by inflammation, which the action of purgatives increases. In the chronic form, on the other hand, moderate use of purgatives is often required, such as one tablespoonful of castor oil, and hot fomentations over the belly, with occasional mustard poultices.

In inflammation of the lower bowel (typhlitis), if recent and unaccompanied by vomiting, a single full dose of castor oil one to two tablespoonsful. Injection of warm water up to four pints, with two tablespoonsful of olive oil (if not at hand, a teaspoonful of salt, milk or honey, may be used instead) to prevent rapid absorption of the water.

Dysentery.—Is an infectious fever whose germs multiply out of the body in like manner as yellow

fever, typhoid fever, and cholera. The duration and effects vary very much. It has been known from the earliest times as a fatal attendant upon war, but it is much more common in tropical countries, especially the west coast of Africa, and, like ague, the effects remain after leaving a tropical country, and the attack recurs.

The predisposing causes are somewhat like those of cholera—errors of diet, exposure to cold and wet, great fatigue, intemperance, bad drainage, and filthy surroundings. The local affection is a specific inflammation of the mucous lining membrane of the large bowel accompanied by griping pain (tormina), straining, and small amounts of grey or bloody mucus, of a peculiar sickening odour, passed at each stool. Dysentery may be either acute or chronic. Acute dysentery (usually with fever) may begin without premonitory symptoms, but generally there is languor, loss of appetite, weakness, and diarrhœa, for twelve to twenty-four hours, when irregular shooting pains, or gripes, begin to attend the discharges. After a short time a sensation of heat ascends the bowel, and pain extends till the whole belly is painful. With frequent inclination to go to stool, more frequent in proportion to the severity of the disease, after much straining and griping pain, a small quantity of mucus or bloody slime is passed, affording momentary relief, but the pain speedily returns, along with the exhausting sensation that something remains in the bowel to be discharged. As the disease progresses the calls to stool become more frequent, and the intervals shorter; the pain concentrates near the lower end of the bowel (rectum); the stools have a peculiar offensive odour, and may contain hardened lumps of fæces, and after the eighth day shreds of fibrous membrane or occasionally pure blood. The symptoms are generally worse at night and early morning,

with short periods of disturbed and unrefreshing sleep. A hot dry pungent skin, furred tongue, urgent thirst, scanty high-coloured urine, and increasingly quick pulse, are signs of increasing danger. Death may occur in the first twelve days, or a favourable change may appear from the sixth to the tenth day, the disease terminating in three or four weeks. Convalescence is always slow from the great amount of albumen lost in the stools, and not unfrequently there is dropsical swelling of the legs, as in Bright's disease.

Chronic Dysentery.—Is a most intractable form of disease, the morbid changes progressing slowly for months, diarrhœa alternating with constipation, and ordinary stools with blood and slime. The patient steadily wastes till he becomes a living skeleton; the skin becomes dry and covered with branny scales. In more than half the cases of dysentery there is also an affection of the liver.

In the severer forms of both acute and chronic dysentery the lower bowel is lined by a false membrane, as the throat is in diphtheria; parts of the lining membrane die from the violence of local inflammation, and leave ulcers, which may go on to perforation of the bowels.

Treatment.—For prevention of dysentery the same precautions are to be taken as for cholera. Avoid indigestible food, exposure to cold and damp, or great fatigue. Disinfect the stools of a dysenteric patient by adding carbolic acid, and where possible bury them. In both acute and chronic dysentery remove if possible to a healthy climate, use warm clothing and flannel next the skin; the food must be nourishing but bland—milk, eggs, unsalted beef tea, grapes, oranges, etc. In the acute form ipecacuanha is of most service and should be given as early in the disease as possible. Let the patient rest in bed in a well-ventilated room, and insert a morphia

suppository, half an hour afterwards apply a hot poultice over the stomach, and let him take 40 grains of ipecacuanha powder, in as small a quantity of drink as possible if he cannot swallow it otherwise; he must remain still in bed and abstain from all drink for the next three hours. Thirst may be relieved by sucking small pieces of ice, or by a teaspoonful of cold water if ice is not to be had. Eight hours afterwards 16 grains ipecacuanha should be given with the same precautions as before, and for several subsequent nights 12 grains at bedtime. The good effect is shown by the pain and straining subsiding; the blood and slime disappear; the patient perspires profusely, falls into a tranquil sleep, and awakes refreshed. Astringent medicines (to restrain the diarrhœa) in acute dysentery are not only useless but dangerous, while a tablespoonful of castor oil with 20 drops of laudanum is often useful, especially where hard lumps are passed. Severe pain and straining may be relieved by the hot bath till the patient is faint. In chronic dysentery opiates are of most service, such as 4 grains of pill of lead and opium every four hours in one day, but must not be continued from the danger of lead or opium-poisoning, and 12 grains of compound ipecacuanha powder along with half a grain of nitrate of silver in pill twice the following day. In the form of dysentery allied to scurvy, the bael fruit is a valuable remedy, one tablespoonful of the liquid extract daily if required. Injections of one pint of water containing 60 grains of ipecacuanha powder and 20 drops of laudanum are often of much use; occasionally castor oil and laudanum have a good effect where astringents do not check the disease. Injections of alum, repeated as often as necessary, have given good results, the ulcer healing readily after a few days. During convalescence milk with a fourth of lime-water should form a

large part of the dietary, and return to ordinary food must be very cautiously made. The scars of ulceration in the lower bowel may cause stricture and lead to habitual constipation.

Bleeding from the Bowels (Melæna).—

1. May occur from ulcers in the bowels opening into blood vessels, which sometimes occurs in typhoid fever. 2. From congestion of the lining mucous membrane, most frequently from cirrhosis of the liver. 3. Like bleeding from the nose, it may occur without any change of structure, which is seen in scurvy and yellow fever. 4. From various inflammations and tumours. If the blood is not in large quantity it is passed like coffee grounds or like tar from the action of the digestive fluids.

The treatment must vary according to the cause, but generally turpentine is of use, 5 drops every half-hour till the bleeding ceases. Eight grains of gallic acid may also be given every second hour if required, so long as any blood appears in the stools. Other remedies are mineral acids and bitters and purgatives such as calomel and jalap, and subcutaneous injection of ergotine. (See BLEEDING FROM THE LUNGS, p. 244).

Obstruction of the Bowels.—May be due to strangulation from bands of fibrin forming an internal rupture (*hernia*), to twisting of the bowel on itself, to strictures, tumours, gallstones, or *intussusception*, which is when one part of the bowel is sucked in by the action of the part below; like the finger of a glove in pulling off, the sheathing part of the bowel constricts the contained part, soon causing enormous swelling.

The symptoms are sudden constipation in a person hitherto healthy, with a sense of uneasiness and flatulence, after a time becoming a fixed pain; the belly is distended, with rolling of the distended bowels. Sickness and vomiting come on, and

gradually increase till the vomited matters, at first greenish from bile, begin to have the odour and appearance of the stools. If the obstruction is complete, and the obstacle is not removed by nature (rarely before life is in extreme danger) or by art, the symptoms go on increasing and terminate fatally about the fifth day. When the symptoms subside, the pain, distension, and vomiting rapidly cease, there are copious stools, and the patient is restored to health. The pain is most severe in intussusception, and least in stricture and impaction of feces.

In intussusception the obstruction may not be complete, a sausage-shaped tumour may be felt in the belly, and the symptoms come on gradually, and may last a considerable time: sometimes there is spontaneous cure by sloughing off of the enclosed bowel. When the obstruction is in the upper part of the bowel, vomiting begins early and is bilious, the belly is not much distended, and the urine is scanty. When lower down in the large bowel, vomiting is later in beginning; at first bilious, it gradually becomes feculent. The belly is greatly distended, and we may see "immense coils of intestine, as big perhaps as one's arm, rise and roll over like some huge snake with loud roarings and flatulence; the distended bowel strives with all its power, but strives in vain, to overcome the opposing barrier."

Treatment.—Diminish the food and drink, giving merely sips of iced fluid, warm fomentations over the belly, position on the back with the legs drawn up; 1 grain extract of opium every two hours till the pain is lessened. When the obstruction is in the lower bowel, 12 grains of compound ipecacuanha powder, and a large injection of four pints of water and three tablespoonsful of olive oil slowly injected; injection of air by a pair of bellows attached to an ordinary tube has also been successful, and was first

recommended by Hippocrates 2,000 years ago. Surgical interference should be required in all cases where the symptoms have lasted more than 48 hours, and may be successful when all other treatment fails.

The previous existence of a rupture (*hernia*) should be inquired for. It forms a small swelling the size of a nut to an egg in the lower part of the groin above the thigh, and if found an endeavour to reduce it may be made. The patient lies on his back with the knees drawn up, and is engaged in conversation to prevent him holding his breath; slight continuous pressure is made over the swelling with one hand, while the neck of the tumour is gently kneaded and occasionally drawn downwards with the other hand. If the swelling is reduced, a truss must be worn afterwards to prevent its return. Time is of the utmost importance in this affection, and therefore a surgeon should be had as soon as possible.

Diarrhœa.—Diarrhœa is a symptom rather than a disease of itself, and is often an effort of nature to get rid of some irritating substance in the bowels by washing it away. The causes may be :

1. Direct irritation of the bowels from indigestible food, and from personal peculiarity (idiosyncrasy). Some persons have diarrhœa from food which is quite digestible to others; for example, shell-fish, pork, mushrooms, honey, etc.; but custom often brings tolerance of what caused much disturbance at first, such as acid wines and very high game. Impure water, raw vegetables, and unripe fruits are common causes, as well as mixed food and drink, which are tolerated separately, such as mixed malt liquor and wines, or even excess of digestible food.

2. Various affections of the lining membrane of the bowels, chronic inflammation, ulceration of the follicles and waxy degeneration of the bowels.

3. Congestion from disease of the heart, lungs, liver, or kidneys.

4. Reflex diarrhœa, which may be due to mental emotions such as fear—hence the vulgar but expressive term “funk”—anger or excitement; or to cold to the skin, exposure to wet, great fatigue; or, in children, teething, which is a very common cause.

Along with the diarrhœa there may be—1. sickness and vomiting with flatulence, the tongue furred, the breath foul, and soreness increased on pressure over the belly; or

2. The tongue may be clean, and nothing beyond the diarrhœa. In either case the stools may be black, yellow, green, white, or mixed with blood.

Treatment.—When the tongue is clean and the pulse natural, a mild purgative should be given, such as 60 grains of compound rhubarb powder. If there is pain or uneasiness in the belly, 10 drops of laudanum may be added. If the complaint continues, astringent medicines must be used, beginning with the milder forms, such as 20 grains of aromatic chalk powder in two table-spoonsful of peppermint or cinnamon-water after each loose stool. A good astringent mixture will be found in 20 drops of sulphuric acid dilute and 5 drops of laudanum taken in a table-spoonful of water every four hours, until diarrhœa ceases. Equal parts of boiled milk and lime-water, a wineglassful after each loose stool, can always be had and is often useful. If these means fail, stronger astringents are decoction of logwood two table-spoonsful, with 3 drops of laudanum, every four hours; pill of lead and opium 4 grains every three hours; tannic acid 4 grains every two hours; sulphate of copper $\frac{1}{2}$ grain every four hours. If none of these succeed, 5 grains of salicin every four hours, 5 drops of tincture of iron in a table-spoonful of glycerine. It is by no means meant that all or even many of the above remedies should be used. In the great majority of cases one or two doses of compound rhubarb powder will suffice, but

occasionally there are obstinate diarrhœas which resist many remedies, and by continuance may imperil the patient's life, and in which all may have to be tried successively. It is of great consequence, especially in severe cases, to keep the patient at absolute rest, lying down, and have warmth applied to the belly, as by hot fomentations succeeded by a mustard poultice. The food must be bland and un-irritating, such as milk, arrowroot, corn-flour, beef tea, gruel, etc. When the stools are frequent, whitish, and jelly-like, a pill of 1 grain extract of *nux vomica*, 3 grains sulphate of iron, and 2 grains extract of *calumba*, to be taken twice a day, is the best remedy, and next to it is pernitrate of iron, 10 drops four times a day in a spoonful of infusion of *calumba* or water. Where there are membranous shreds or stringy mucus in the stools (usually chronic), tar and arsenic are the best remedies, 2 drops of creosote and 4 drops of liquor arsenicalis three times a day.

When the tongue is covered with white fur and the breath foul, a drachm of sulphate of magnesia (Epsom salts) with 5 drops of tincture of opium, in a tumblerful of camphor water, if required, every six hours, till given thrice, and followed when necessary by 20 drops of dilute sulphuric acid with two tablepoonsful of compound tincture of gentian in a glass of water, thrice a day, are usually effectual. The food must be unirritating—slops, puddings, white fish, and for drink weak brandy and water is both an astringent and stimulant, and also prevents vomiting.

In the diarrhœa attending the last stage of consumption and many wasting diseases from amyloid affection of the bowels, injections of starch mucilage fourtablepoonsful of the consistence used for starching a shirt, and 20 drops of laudanum, may succeed when all remedies by the mouth are ineffectual.

Colic.—Is a severe pain seated in the belly, caused by contraction of the muscular fibre of the bowels from indigestion or some irritant, or a general cause such as cold or lead (see POISONS. p. 404).

The pain is of a sharp twisting nature, and is seated round the navel, it occurs in paroxysms, and the whole attack may last for a few minutes to hours, when it suddenly stops.

The bowels are generally but not always constipated, and there is often sickness and vomiting, but no fever, hot skin, or quick pulse.

Wind may be felt and heard moving in the bowels, causing excessive local distension and severe pain, which is relieved by pressure; hence the patient is doubled up or rolls about. The walls of the belly participate in the spasm and are hard and tense, either drawn in, or, if there is much flatulence, puffed out. The bladder may participate in the spasms, the urine being frequently ejected or suppressed.

Treatment.—A large hot poultice to the belly, or anything hot which is at hand, salt, sand, hot-water bottle, warm bath. Six grains of calomel and 1 grain of opium, followed by 30 grains of compound rhubarb powder, to be repeated every five hours till stools are obtained. In mild cases, the compound rhubarb powder alone will suffice. Injections, such as warm water and olive oil, sometimes give immediate relief.

Inflammation.	Colic.
Fever.	None.
Pain increased by pressure, patient lies on his back with legs drawn up.	Pain relieved by pressure, patient lies on his belly, or rolls about.
Tongue white, pulse quick, skin hot.	Tongue clean, pulse natural, skin cool.

Constipation and Costiveness.—As a rule most people go to stool every day, but some only every second or third or even longer. Constipation means retention of fæces beyond the usual period, so that they are passed with difficulty and in a comparatively hard state. Habitual constipation means a prolonged departure from the standard natural to the individual. The direct cause may be want of sensibility of the nerves of the mucous membrane, so that contact of food does not cause sufficient stimulus to produce muscular action, or want of tone in the muscles, or absence of mucous secretion from the bowels which lubricates the passages, or finally, absorption of fluid, leaving the fæces too solid for the muscles to act on.

Constipation is one of the most common ailments, and is usually due to faulty dietary and sedentary habits, though some persons have a marked constitutional tendency to constipation, which may be relieved but cannot always be overcome. Almost all acute diseases begin with constipation; it is also a frequent accompaniment of chronic diseases, pregnancy, and various forms of indigestion and affections of the liver, as well as arising from astringent food or medicines. There may be constipation although stools occur at the ordinary intervals, from a portion only of each stool passing, another portion being retained and gradually accumulating in the lower bowel.

Constipation gives rise to various uneasy and often distressing sensations both in the bowels and in other parts at a distance. There is a sense of mental and bodily depression, headache, loss of appetite, low spirits, often a tendency to vomit; in habitual constipation there is also dry skin, a sallow complexion, scanty urine, and low spirits, sometimes amounting to hypochondriasis. The pressure of the loaded bowel on the great veins causes cold feet by

hindering the return of blood from the legs ; pressure on the nerves causes numbness of the legs, and on the small veins causes blind and bleeding piles. Sometimes chronic inflammation of the mucous lining of the bowels is the cause ; hence people who lead a luxurious life often suffer from habitual constipation.

Professor Niemeyer says : " We often meet persons, who at the University were great beer-drinkers, and were most jovial and popular fellows, who, a few years later, have become ill-tempered and peevish, and have no thoughts beyond whether they ' will have the longed-for passage to-day.' "

Treatment.—Many a sufferer from constipation is led into the pernicious habit of continual use of strong purgatives. The first time he probably feels dull, heavy, unable to work and depressed in spirits, but after the purgative has wrought he feels light, elastic, cheerful, and altogether a new man ; encouraged by this result, he repeats the dose with less effect each succeeding time, till finally it positively induces constipation by causing chronic inflammation of the lining membrane of the bowels, and the last state is worse than the first. Different persons vary so much in the amount of purgatives they require that each person must be a law to himself. Those who live principally on fish require usually very large doses ; in one such case a dose of croton oil, which would be fatal to many people, was described by the patient as producing merely a " comfortable easement." For occasional and accidental constipation any of the milder laxatives may be used, castor oil and senna being common and safe laxatives. In obstinate constipation a drachm of sulphate of magnesia and 2 grains of ipecacuanha in a tumbler of water every hour will generally succeed. Where there is acidity of the stomach, carbonate of magnesia, half a teaspoonful. If there are piles, a

teaspoonful of sulphur and half a teaspoonful of cream of tartar mixed with honey or treacle. If the stools are clay-coloured, 3 grains of calomel with a drachm of taraxacum juice. In habitual constipation it is important to use drugs as little as possible.

*He 'scapes the best who, nature to repair,
Draws physic from the fields, in draughts of vital air.*

A regular habit as to time, moderate outdoor exercise, such as rowing, grass-cutting with a machine, cricket, lawn tennis, etc., an hour at least every day.

Where the mucus secreted is deficient, a glass of water before going to bed or just after rising. Meals should be taken regularly at the same time; animal food should be taken sparingly, but vegetable and ripe fruits freely. There is such a thing as a laxative diet, and it should be adhered to by the patient; vegetable food, especially succulent vegetables, is more laxative than animal, while all oily and fatty foods are decidedly laxative, so much so that a quarter of a pound of fresh butter melted and unthickened with flour acts almost as certainly as castor oil. The different bread stuffs seem to be laxative in proportion to the amount of fat they contain: thus

In fine wheat flour	.	.	.	2 per cent. of fat.
In bran of wheat	.	.	.	6 " "
In Scotch oatmeal	.	.	.	6 " "
In Indian corn	.	.	.	8 " "

From this table we see that fine wheat bread contains only one third the quantity of oil that oatmeal or brown bread made of wheat meal does.

Rice contains very little oil, and hence its constipating tendency. Indian corn, on the other hand, is very rich and fat, and might be more

extensively used with advantage, the corn cakes and green corn of our American friends being delicacies in great favour across the Atlantic. A moderate quantity of liquid should be taken along with each meal, as very dry food favours constipation. Friction over the belly with the hand or a flesh brush, and sometimes electricity, are useful by helping to give tone to the muscles. The clothing should be warm, and flannel worn over the belly both summer and winter. When diet and regimen fail to produce the desired effect, they must not be given up as useless but perseveringly continued along with the use of medicines, and the medicines should be stopped as soon as it is possible to do without them. On the whole aloes is the most generally useful purgative, acting also as a tonic, but it should be avoided when there are piles or inflammation. The following pill is suitable for most cases: extract of aloes 1 grain, extract of nux vomica $\frac{1}{4}$ of a grain, ipecacuanha powder $\frac{1}{2}$ a grain, sulphate of iron $1\frac{1}{4}$ grain, to be made into pills, one of which should be taken half an hour before breakfast and dinner at first, but as soon as possible before the principal meal only. In elderly people a tablespoonful of compound decoction of aloes answers better, from containing a considerable amount of aromatics. But the best pill for obstinate constipation is the compound aloin pill (Sir Andrew Clark) taken before the last meal of the day, and continued until the bowels become regular. I have seen most obstinate cases completely cured by this alone. It contains $\frac{1}{2}$ grain of each of the following drugs: Aloin, extract of nux vomica, sulphate of iron, myrrh, and soap. The liquid extract of cascara sagrada, 30 drops every morning on sugar, is also a most useful laxative, and gives excellent results. When the bowels are very torpid compound colocyath

alone, or mixed with an equal amount of compound gamboge pill, may be needed, 5 grains or upwards. Injections of about a pint of cold water are a good and safe plan of treating constipation occurring in the lower bowel, and have the great advantage of causing no harm by prolonged use. When a large mass of fæces has accumulated in the lower bowel it may be necessary to remove it by manual interference, as by the handle of a teaspoon, and by repeated injections of warm soap and water.

Worms.—Most, if not all, animals and vegetables have their own peculiar parasites, animal or vegetable, or both. It seems an offence against the economy of nature when we see the higher animals, and even man himself, perishing to afford food and means of propagation to these lower organisms which serve no useful purpose and are always destructive; even parasites themselves are infested with other parasites, a truth expressed in the rhyme:—

*Big fleas have little fleas upon their backs to bite 'em,
And little fleas have lesser fleas, so on ad infinitum.*

There are seven principal varieties of worms which may be found in the bowels:—

1. *Sclerostoma duodenale*, which is unknown in this country, but is not uncommon in Italy and Egypt; it is a small worm, about half an inch long, which infests the upper part of the bowels and causes bleeding at stool, and consequent bloodlessness of the system.

2. *Round worm (Ascaris lumbricoides)*.—Is somewhat like a large earth-worm, and infests the small bowel and gall duct.

3. *Tape-worms*.—They undergo an intermediate form of development comparable to the grub state in a moth. The eggs are swallowed by some animal and develop a living embryo, after some minor

changes termed a cysticercus, which becomes encysted in the muscles, and when this is swallowed raw or insufficiently cooked the embryo develops into a tape-worm, of which there are three chief varieties:—(1) Broad tape-worm (*Bothriocephalus latus*), found in Russia, Sweden, and Switzerland, the embryo of which is swallowed in drinking water, or in eating various fish, such as salmon, dorse, etc. 2. Common tape-worm (*Tenia solium*), the embryo of which is the cause of so-called measles in pigs. The head has four suckers and two rows of hooklets. (3) Hookless flat-headed tape-worm (*Tenia medio-canellata*), the embryo of which is found in calves and oxen. The broad tape-worm may be 6 to 20 feet in length, and the other two may be found up to ten yards in length. They are all narrow at the neck, and gradually grow broader as they go down. The growth takes place by new joints forming at the head; hence the minute head must come away, or there will be no cure.

4. *Thread-worms*, which infest the large bowel. The long thread-worm (*Trichocephalus dispar*), one and a half to two inches long, as thin as a hair at one end and considerably thicker at the other, usually presents no symptoms, but may cause diarrhœa. The common, or short thread-worm (*Oxyuris vermicularis*), a quarter to half an inch long, is very common in children, and may be passed in great numbers in the form of balls. The eggs are supposed to be swallowed in bad flour and imperfectly washed vegetables.

Symptoms.—The symptoms vary greatly with the peculiarities of the person affected. In round and tape-worms not unfrequently there are absolutely no symptoms, the first thing to attract attention being the passage of worms or sections of tape-worms at stool, but generally there is marked derangement of general health: the belly becomes swollen, hot, and

tense, the appetite variable, often voracious, the breath becomes offensive, there are pains in the stomach and bowels, itching of the nose causing picking, and if a round worm reaches the stomach vomiting may be added, by which it is sometimes expelled. In addition to these symptoms, there is often considerable wasting, disturbed sleep, and grinding of the teeth; more rarely squinting, pains in the limbs, and great depression. In children and young people the irritation of the bowel may cause cough, chorea, or epilepsy. Thread-worms generally cause intolerable itching of the fundament, irritation and picking of the nose, offensive breath, disturbed sleep, and grinding of the teeth, capricious appetite, and the worms may be seen moving in the stools, which is the only conclusive symptom in all worm affections.

Treatment.—For thread-worms: injections of infusion of quassia, which is a poison to the worms, are best, and next to this are strong salt water, three table-spoonful of salt to a pint of water, or lime-water; a teaspoonful of castor oil, and 2 grains of santonin should also be given by the mouth for a child of six years of age. For round worms: 4 grains of compound scammony powder, followed in four hours by 2 grains of santonin, and the next day 4 grains of carbonate of iron morning and night, to be continued for a week, the doses given being for a child of six years of age. For tape-worms, the most valuable remedy is extract of male fern; other remedies often given are decoction of pomegranate root bark 4 ounces, cusso half an ounce, or turpentine 1 ounce. But they are all objectionable. Pomegranate sometimes causes pain in the bowels, cusso sickness and vomiting, and turpentine may irritate the urinary organs. The following treatment has hitherto been uniformly successful in my experience. The doses are for adults: a table-spoonful

of castor oil is to be taken at bedtime; if oil cannot be taken, 4 tablespoonsful of fluid magnesia (carbonate) may be used instead. In the morning the dose is to be repeated, and no food beyond milk and tea, not even a single biscuit, is to be taken during the day. At bedtime a drachm of the ethereal extract of male fern is to be taken; it may be taken in a tablespoonful each of mucilage of acacia and peppermint water. Next morning 10 grains of compound scammony powder are to be taken, which brings away the whole worm, or worms, if there are more than one.

The precautions to prevent tape-worm are, to thoroughly cook all meat and sausages, and for cooks, etc., avoid putting the knife which is used for cutting meat to the mouth.

Piles.—This troublesome affection consists of small tumours, usually about the size of a bean, and which originate from enlargement of the ends of the veins in the lower part of the large bowel. They may be external, just outside the bowel, around the orifice, either one or a cluster, covered with skin, or internal near the termination of the bowel and covered with mucous membrane, appearing of a dark pink or purple colour, and varying in size from that of a pea to a walnut. Piles are divided into bleeding piles, which have thin walls and bleed from the slightest cause, and blind piles, which do not bleed, the walls being thicker, but being more liable to inflammation. External piles if indolent appear like folds of skin round the orifice and are troublesome only by their bulk, but if inflamed, commonly called a fit of piles, they become exceedingly sensitive, tense, and painful, appearing like a grape in size, and of a purple colour, with heat, throbbing, straining, and perhaps backache. The patient can scarcely sit, walk, or lie and the passage of even soft stools causes great

pain, which only slowly disappears. If the inflamed piles suppurate and burst there is immediate relief of all the symptoms. The symptoms of internal piles are very slight at first; there is a feeling as if there was a foreign body in the bowel requiring to be passed, but there is positive pain only when there is a hard stool; usually small amounts of blood and mucus are passed at intervals, and there is a continuous sense of weight and discomfort, increasing when there is inflammation to the symptoms already mentioned in external piles. At first the piles are protruded only during straining, and if not promptly replaced are grasped by the constricting muscle of the bowel and more or less strangulated, causing great pain and disturbance, but after long continuance the piles are always down except when the patient is lying down, the constricting muscle becoming relaxed. After some time, if the piles bleed easily, the patient becomes sallow, loses flesh, and presents a bloodless appearance.

Piles may be caused by anything which lowers the tone of the veins. In many people there is an hereditary tendency to piles, just as there is to varicose veins. The usual predisposing causes are sedentary habits, the insufficient exercise lowering the tone of the system generally, the veins included; luxurious living, the excess of food and drink producing congestion of the liver and hindering the flow of blood from the lower veins. Direct causes are constipation, pregnancy, and various tumours which press on the veins and impede the return of blood, the increased pressure of the blood causing piles. Probably the most frequent of all causes is local inflammation of the mucous membrane of the bowel, weakening the veins and so leading to piles; this not unfrequently results from the abuse of strong purgative medicines, especially

aloes, and is also often caused by prolonged exposure to cold, as from sitting on cold stones.

Treatment.—For the permanent cure of both internal and external piles when of any extent, surgical interference is usually required. The medical treatment consists in procuring regular daily evacuations of the bowels, avoiding strong irritant purgatives. A teaspoonful of the following mixture twice a day or oftener is a good laxative: half an ounce each of sulphur and cream of tartar, and $2\frac{1}{2}$ ounces each of lump sugar and syrup of lemons. If this does not succeed, compound liquorice powder may be used in the same doses or equal parts of the confections of sulphur, senna, and black pepper, one or two teaspoonsful to be taken every morning before breakfast; sometimes careful injection of about 2 ounces of cold water before each stool is useful, but care must be taken not to injure the piles. The cause if possible should be removed; luxurious livers must restrict themselves to a moderate allowance of plain food and sparing use of alcohol. Protruded piles should at once be returned, which may be facilitated by pouring a jug of cold water over them, but if inflamed they should be poulticed, and pain may be relieved by opiates. Bleeding may be checked by ointment of galls, or if there is pain ointment of galls and opium locally, and 10 drops of nitrohydrochloric acid in a glass of water every four hours, if required. In some cases 2 drachms of glycerine three times a day is to be preferred.

Prolapsus Ani.—Sometimes in children there is protrusion of the whole bowel (prolapse), to replace which the child should be placed on its front and slight compression made round the base of the swelling, while with the other hand it is gently pressed in, or a finger may be passed into the bowel carrying it up, and the orifice supported while withdrawing the finger.

GROUP IV.

AFFECTIONS OF THE LIVER.

The liver is composed of cells arranged in small groups or lobules, and receives the veins from the bowels, termed the portal veins, which run along with the artery and bile or hepatic ducts. Each lobule has a small branch of the portal vein, bringing blood—containing matters from the digestive organs, from which it secretes the bile, which is then received by the branch of the hepatic duct and carried to the gall bladder; the purified blood is then received by a small branch of the hepatic vein of the liver which begins in the middle of the lobule, and is carried to the large vein of the lower half of the body, by which it enters the general circulation. Thus the liver, besides secreting bile, removes any noxious matter which may have been taken up from the bowels by the blood vessels.

The liver is subject to a great number of different affections, the symptoms of which are usually obscure. The following are merely mentioned, as they can generally be recognised only by a physician:—

Abscess is most generally found in tropical climates, especially after attacks of dysentery. It may open into the lungs, bowels, or externally by several small openings.

Acute Yellow Atrophy usually sets in like a bilious attack, and is rapidly followed by jaundice, fever, vomiting, and delirium, with high temperature, gradually falling into profound sleep (coma), and death occurring in the first week.

Cirrhosis (Gin-drinkers' liver).—The liver is at first enlarged, but subsequently wastes, and is rough on the surface like nails in a boot. The symptoms are usually indigestion, flatulence, and wasting; after some time dropsy of the belly or feet, dirty-

yellow skin, and bleeding from the bowels or piles.

Finally, after months or years, the patient dies exhausted. The cause is generally spirit-drinking, though frequent attacks of intermittent fever and immoderate indulgence in hot spices also produce it.

Waxy Liver (amyloid disease) is a degeneration which may occur after long continuance of wasting diseases, such as ulcerations of bones, consumption, malarious fever, etc. The liver is never affected alone, but generally along with the spleen and kidney, and in the latter stages with the bowels, causing diarrhoea. Death occurs from exhaustion.

Hydatids are cysts caused by the burrowing embryo (cysticereus) of a tape-worm, and contain smaller cysts floating in them. It is most frequent in Iceland, the eggs probably being swallowed in water.

Fatty Liver (infiltration) may be either fat stored up in the liver from too much food and too little exercise, most commonly found in drunkards and Strasbourg geese, or it may be fatty degeneration, seen in poisoning by phosphorus.

Cancer of the Liver is a common disease and occurs in parts of the liver only, usually forming tumours. The patient wastes and usually dies of dropsy.

Tubercle of the Liver is an accompaniment of consumption of the lungs.

Treatment.—Abscess, opening, by antiseptic surgery, rest, and attention to general health.

Cirrhosis—Avoid spirits and spices; regular action of the bowels by carbonate of magnesia; for pain, hot fomentation and leeches.

Waxy or Amyloid liver, a part of general waxy degeneration—Good food, carbonate of iron, and iodide of potassium.

Fatty liver—According to the cause; less food and more exercise, or nourishing food.

Cancer—See p. 113.

Congestion of the Liver.—May be due to obstructed circulation from disease of the heart or lungs (passive), or to increased secretion of bile. sudden chills, cold stages of malarious fevers, over-indulgence in food and alcoholic drinks, or exposure to very high temperature. Congestion is the most frequent form of "liver" in India. The liver is swollen and tender on pressure, and feels uneasy on standing. There is usually purging of bilious stools, with scalding and slight sickness, a bitter taste and foul tongue, sometimes also vomiting and headache. The face is sallow or dusky, fat and flabby, the fat seeming softer than healthy fat.

Treatment.—Restricted diet, avoidance of hot spices and fermented liquors; active exercise in the open air. Five grains of calomel at first, and two teaspoonsful of cream of tartar every second day for a fortnight. A change to a cold climate for those in the tropics.

Jaundice (for Bilious Attacks, see p. 309) is a symptom of disease rather than a disease in itself. The causes of jaundice are very numerous, and are divided into two classes:—

1. *Jaundice from Suppression*, when those of the bile principles which are formed in the blood are not excreted, and accumulating cause jaundice. This may be due to deranged circulation in the liver, such as congestion; to deficient nervous power, the result of strong passions or emotions:—it is a common saying that such a person got yellow with envy. It may be due to various acute diseases, such as yellow fever, to animal or other poisons which destroy the red corpuscles of the blood. We see a local example of this in a bruise, which becomes green and yellow before disappearing,

owing to the destruction of the blood effused under the skin. And finally it may be due to destruction of the secreting liver cells, which occurs in diseases such as atrophy, cancer, tubercle.

2. *Jaundice from Obstruction*, in which the bile is reabsorbed after being secreted. The gall duct may be choked by gallstones, or foreign bodies from the bowel, by inflammation of the lining membrane of the bowel choking the orifice, by inflammation of the liver or gall duct, by stricture of the duct, spasmodic or permanent, or by pressure of tumours. In jaundice from obstruction, after a time there is also suppression, the pressure of bile in the gall bladder preventing secretion. The colour of the jaundice is deeper than from suppression only, owing to the bile acids which are formed by the liver being absorbed, and destroying some of the red blood corpuscles.

Symptoms.—The first thing noticed, apart from the symptoms of any disease which may be causing it, is a yellow tint of the white of the eyes and at the roots of the nails, gradually appearing also on the skin, and most intense on the forehead. The tint varies from a very slight yellow to the colour of gold, and is invisible by gaslight. If a finger is pressed on the lips or gums, the resulting spot is not white but yellow. The urine becomes dark-coloured or deep red, and stains linen or paper yellow: the sweat also stains linen yellow. The stools are often abundant, and of a white or clay colour from absence of bile, and contain more fat than healthy stools. There is a bitter taste in the mouth, indigestion for fatty foods, and flatulence owing to the absence of bile, which is a strong natural antiseptic, and which prepares fat for absorption by liquefying it. For the same reason there is often considerable wasting. The pulse is slow, and the patient is languid, sleepy, and very

easily fatigued. Bleeding sometimes occurs from the bowels, gums, or under the skin, from destruction of the red blood corpuscles, as in yellow fever and scurvy. The skin is dry, scaly, and itching, and occasionally there is yellow vision from the clear parts of the eye containing bile principles. In severe cases there may be drowsiness going on to stupor from action of the bile principles on the brain, which was recognised as a bad symptom by Hippocrates 2,000 years ago.

To distinguish obstruction from suppression, fill about an inch of a test-tube or narrow glass with the urine and add a piece of loaf sugar the size of a pea; then pour half its bulk of strong sulphuric acid gently down the side of the tube or glass, so as not to mix the fluids. If a purple or scarlet line appears at the junction of the liquids it shows bile acids are present, and jaundice is therefore due to obstruction; but if merely a brown colour appears, acids are absent, and therefore it is due to suppression.

Treatment.—Remove the cause if possible.

For suppression, 20 grains hydrochlorate of ammonia, 15 grains extract of taraxacum, and half an ounce each of compound tincture of gentian and compound decoction of aloes, to be taken twice a day for three days, and afterwards magnesia and ammonia as for obstruction.

For obstruction, an ounce of compound decoction of aloes, twice a day for two days. Afterwards 15 grains carbonate of magnesia, 30 grains sulphate of magnesia, and half a drachm aromatic ammonia in 2 ounces of camphor water three times a day an hour before food. Food should be meat and strong soup chiefly, but no fat or butter.

Recovery is first shown by the colour returning to the stools and gradually fading from the body.

Gallstones are usually composed of solidified

cholesterin, a fatty constituent of bile, and may be numerous, or only one varying in size from a hemp seed to a hen's egg. They occur more frequently in women than in men, and usually after middle age, forty to sixty. They are very frequent in patients suffering from cancer of the stomach and liver, but their formation and presence cause no pain till from some cause a stone enters the gall duct, when the patient is suddenly attacked with violent piercing or griping insupportable pain at the opening of the duct into the bowel, but soon spreading over the belly, the right side of the chest, and even the right shoulder, and darting through the back, in paroxysms varying from a few minutes to a few hours in length. There is often shivering, sickness, and vomiting, with constipation and flatulence. The pain is so violent that patients roll about, moan, and double themselves up. The pulse is small, the skin cold, and the face pale and distorted. The passage from great agony to complete ease sometimes occurs suddenly when the stone enters the bowel, but at other times the pain subsides gradually. The total duration of the attack may be a few hours to several days or even weeks. Jaundice is not such a frequent symptom as we should expect; a more formidable occurrence is ulceration and perforation of the gall bladder or duct.

Treatment.—Hot baths; hot poultices; hot fomentations; hot drinks of water, containing 15 grains of carbonate of soda to a pint; $\frac{1}{2}$ a grain of opium every hour till the pain is relieved, or the effects are seen, and then every six hours. After the pain has stopped, a tablespoonful of castor oil to expel the stone. To prevent recurrence of a stone, a daily bottle of soda-water alternately with potash-water.

GROUP V.

AFFECTIONS OF THE PERITONEUM.

Diseases of the Belly.—The belly is lined inside by a thin, shining serous membrane, called the peritoneum, in a complicated fold of which are enelosed the bowels with their blood vessels, digestive vessels, or lacteals and glands. There are three principal diseases in connection with this membrane: inflammation or peritonitis, dropsy or ascites, and diseases of the digestive glands enclosed in the fold, or consumption of the bowels.

Peritonitis may be acute or chronic, and of a part or of the whole. It may occur from wounds or ulcers opening into the lining membrane, from extension of other inflammation of parts near it, or occasionally from cold in rheumatic persons.

Acute peritonitis, usually from perforation of an ulcer, begins by sudden severe pain at one spot; but soon the whole belly becomes very painful, and the pain is greatly increased by the slightest pressure or movement; even the weight of the bed-clothes may become unbearable; the belly becomes hard, hot, and swollen from inflammation of the outside serous lining of the bowels (peritoneum) paralysing the muscular coat and allowing the gut to become distended with air either from the decomposing contents of the bowel or perhaps from the blood; the skin is dry and burning. The patient does not toss about as in colic, but lies on the back with the knees bent and the legs drawn up to relax the muscles. There is quick, feeble pulse (90 to 120), anxious face, foul tongue, frequent vomiting and constipation; the patient fears to cough or speak loud, and takes slight breaths with the chest only; hence the breathing is very rapid (40 to 60 breaths in a minute). After a time the

belly becomes more distended, partly by fluid in its cavity and partly by air in the bowels, and when the disease is about to end fatally it gets swollen like a drum; the face becomes ghastly, and the body covered with cold clammy sweat. Death usually takes place from exhaustion within the first eight or ten days.

If the disease takes a favourable course, the pain, swelling, and fever subside, and the patient recovers rapidly; but frequently adhesions of the bowels are left, causing occasional pain and constipation for the rest of life.

Treatment.—One grain of opium every hour till its effects are seen, and then every third hour. The bowels must be prevented from moving for several days; turpentine cloths over the belly; ice to suck to relieve the thirst and vomiting; liquid food only—milk and unsalted beef tea are best; if vomited, injections of milk, beef tea, and beaten-up eggs.

Chronic peritonitis may follow acute, but is more frequently chronic from the beginning, especially in serofulous children. There is slight pain and tenderness on pressure, wasting and slight fever, alternate constipation and diarrhœa, with swollen belly.

Treatment.—Milk diet; cod-liver oil; iodide of potassium (4 grains), daily.

Dropsy of the Belly (Ascites). The lining membrane of the belly secretes a small amount of fluid in health, which allows the opposing surfaces to glide smoothly over each other. Dropsy may be due to anything which either increases the secretion of this fluid, or more commonly which prevents its absorption, the secretion still going on. The cause may be disease of the liver, heart, kidneys, or chronic peritonitis. The belly becomes swollen with shining skin and enlarged blue veins running over it. When lying down the shape changes with every movement

of the body, and if the uppermost part be tapped smartly with the finger it sounds hollow, from the bowels floating to the top of the fluid; but on changing the position the part now uppermost sounds hollow, while the former part sounds dull, the navel is protruded, and there is often also dropsy of the legs. The upper part of the body is wasted, breathing is hindered, especially when lying down, the urine is scanty, the skin dry, and the patient suffers from thirst, loss of appetite, low spirits, and weakness.

Treatment varies with the cause, but the following is more or less suited to all forms: a quarter of an ounce of cream of tartar and 7 to 8 grains of tartrate of iron twice a day, along with 5 drops of tincture of digitalis in an ounce of camphor water. When the accumulation embarrasses the breathing, relief may be obtained by tapping (p. 439).

Consumption of the Bowels (Tabes Mesenterica) is a local indication of a general disease, "scrofula," which attacks the glands of the digestive vessels or lacteals and destroys them by slow inflammation as it does the glands of the neck, or by deposition of a peculiar matter called tubercle, which softens and breaks down, causing abscess or ulceration. Tubercle may attack any part of the body except the muscles, blood-vessels, and cartilage; but the parts most liable are, in infancy, the head, causing water-brain fever (tubercular meningitis): in childhood, the belly, causing consumption of the bowels; and after puberty, the lungs, causing common consumption; when it appears in other places, it is usually secondary to the foregoing, and it is worthy of remark that it is never found at birth.

The symptoms are hard swollen belly, more or less constant pain in the bowels with unhealthy, watery, offensive stools, and occasional constipation; the

body wastes, the face becomes pale, and there is rapidly increasing weakness.

Treatment.—Milk and lime-water occasionally varied by milk and soda-water, two pints of milk to one of lime or soda-water; cod-liver oil one teaspoonful daily; phosphate of iron 4 grains twice a day; iodide of potassium 2 grains daily. Flannel to be worn next the skin both night and day, free ventilation, especially in the bed-room, sea air, and warm or tepid salt water baths. (See TREATMENT OF SCROFULA, p. 118, and CONSUMPTION, p. 268.)

For the diarrhœa grey powder with rhubarb 2 grains of each three times a day or 2 grains each of Dover's powder and grey powder.

CHAPTER VII.

DISEASES OF THE URINARY SYSTEM.

(*N.B.—Venereal Diseases are given in an Appendix published separately.*)

Urinary Sediments or Gravel consist of concrete particles of the urinary sediments, which, when larger, form stone in the bladder or kidney. There is not unfrequently hereditary tendency to its formation, and that to the same form of gravel as the parents.

There are three chief kinds of gravel, each of which may be caused by a constitutional tendency to its formation (diathesis).

1. **Uric or lithic acid diathesis.**—When urates are excreted in such excess that they are deposited in the chamber vessel when the urine cools, appearing like brick dust in colour. If the particles are of any size there is pain shooting from the kidney to the bladder when making water; sometimes there is also sickness. The cause is usually errors in diet and sedentary habits, strong wines, malt liquors, and too much animal food and anything which causes indigestion. It also occurs in gout and rheumatism and towards the end of fevers and acute inflammations. The urine is acid, sp. gr. 1015 to 1035, and the deposit redissolves on the application of heat.

Treatment.—Bicarbonate of potash half a drachm twice a day. Citrate of potash 10 grains four times a day, along with 4 drops of turpentine. If the bowels are confined, two teaspoonsful of sulphate of magnesia in half a pint of water. When due to gout, 15 drops of tincture of colchicum twice a day carefully watched. The patient must regulate his diet, avoiding animal food, strong wines, malt liquors and anything which disorders his stomach, and using chiefly vegetable diet and white fish. He should rise early, take a good deal of exercise, and be warmly clad.

2. Phosphatic diathesis.—When the phosphates are excreted in excess the urine on standing deposits a white material like very fine white sand, and may have an iridescent film of phosphates, or it may be of a slight milky colour when passed. The deposit is not dissolved by heat, but readily disappears by adding a little nitric acid. The cause of this variety may be anything which weakens the system—a naturally weak system, severe mental exertion, exposure to cold—and one form, the triple phosphate, often proceeds from irritation or inflammation of the bladder.

Treatment.—Tonics and acids with warmth and good diet. Tincture of the perchloride of iron 10 drops, in a tablespoonful of infusion of calumba, three times a day after meals. Quinine, 2 grains daily, animal food, milk and wine, one glass of sherry daily.

3. Oxalic acid diathesis.—The urine is generally clear, pale, and contains a small cloud of pale mucus entangling crystals of oxalate of lime. The symptoms are transient pain on making water from irritation of the passages by the crystals and usually depression of spirits.

The cause besides constitution may be eating various vegetables containing oxalates, especially

rhubarb and sorrel, probably also new beer and sparkling wines.

Treatment.—Ten drops of nitro-hydrochloric acid in a glass of water three times a day, cold bathing, warm clothing, and friction of the skin.

Stone in the Kidney: Kidney Colic.—Any of the variety of salts before mentioned may form a concrete mass or stone either in the kidney or in the bladder. So long as the stone is retained in the kidney it may give rise to no uneasiness, but if of considerable size it may cause almost constant backache, bloody urine especially after exertion, nervous irritability, with loss of strength and wasting.

When the stone passes into the urine duct leading to the bladder it sets up violent symptoms. There is sudden excruciating agony in the loins, with irritation of the bladder, and often with sickness and vomiting, but notwithstanding this the quickness of the pulse and heat of the skin and body are unaffected. After a time the paroxysm of pain remits, and the patient has a short interval of ease; but it soon returns, till, after several paroxysms, the stone passes into the bladder, giving instant relief to the acute pain, but leaving a sense of soreness for some time.

Treatment.—During the attack a hot bath till the patient is faint, and one-grain doses of opium every hour, carefully watched till the effects are seen. Warm barley water or other mucilaginous drink to be used. Inhalation of chloroform has been used, but is dangerous, and only to be given by a qualified person.

Bright's Disease of the Kidney.—The substance of the kidneys is composed essentially of a number of long tubes lined by secreting cells, of blood-vessels, and of some connective tissue or packing material. A urinary tube usually com-

Bright's Disease.		History of preceding disease.	History of existing disease.	URINE.				Dropsy.	Uræmia (blood-poisoning).	EYE SYMPTOMS.		Thoracic (chest).	Abdominal (belly).
				Quantity.	Colour.	Proportion of albumen (chemical test).	Deposits (microscope).			Uræmic.	Neuro-retinitis.		
Inflammatory form.	1st Stage. Secreting cells inflamed.	Scarlatina, diphtheria, measles.	Generally acute. Sometimes gradual.	Diminished.	Dark, smoky, or bloody.	Large.	Blood corpuscles, bloody, granular, and hyaline casts.	Early and severe.	Acute with convulsions.	Occasional.	Very rare.	Inflammation rare.	Peritonitis rare.
	2nd Stage. Fatty degeneration, kidney increased.	"	"	Less or not increased.	Dark or pale.	"	Fatty, granular, and hyaline casts.	Severe or diminished.	Do. or chronic.	Rare.	"	Do. Hypertrophied heart not uncommon.	"
	3rd Stage. Washed out and kidney wasted.	"	"	Less, natural, or more.	"	"	"	Severe or slight, occasionally renewing.	Do. but more commonly chronic.	"	Rare.	Hypertrophied heart common.	"
Wazy.	1st Stage. Vessels degenerated.	Syphilis or chronic supuration.	Commencing insidiously.	Increased.	Pale.	None or small.	None or very few hyaline casts.	None.	None.	None.	None.	Phthisis common.	Liver and spleen enlarged. Diarrhœa.
	2nd Stage. Changes in the tubes.	"	"	"	"	Small or large.	Few hyaline or finely granular casts.	None or very slight.	"	"	"	"	"
	3rd Stage. Kidney.	"	"	"	"	"	"	None or slight.	Chronic or rarely acute.	Very rare.	Very rare.	Phthisis uncommon. Hypertrophy of heart rare.	"
Cirrhotic.	Early stage.	Gout, lead-poisoning.	Commencing very insidiously.	Natural.	"	None or small.	Few hyaline casts or none.	None.	None.	None, perhaps occasional.	None.	None.	Occasional cirrhosis of liver.
	Later stage.	"	"	Natural or increased.	"	Considerable, rarely large.	Few hyaline casts, fatty and granular.	None or slight.	None or slight.	Occasional	Common (Ophthalmoscope).	Inflammations. Occasionally heart hypertrophied.	Peritonitis rare, occasional cirrhosis of liver. ¹

¹ Professor Grainger Stewart.

menees near the surface of the kidneys as a dilated sac (Malpighian body) enclosing a tuft of blood-vessels, forming the sudden termination of an artery and vein, the small branches dividing so quickly from the main vessel as to resemble a mop-head to its handle. This tuft allows the water of the urine to pass through the walls of the vessels composing it, from the blood into the urinary tube. The vein which issues from the tuft in which the artery terminates passes to the urinary tube below the sac, and breaks up into a fine network surrounding the tube, and finally reunites to pass off to the great vein of the kidney. It is from the less watery blood in this venous network that the solid constituents of the urine are drawn into the cavity of the urinary tube through the agency of the secreting cells with which it is lined. These solids are washed away by the stream of water from the tuft in the sac at the end of the tube. The urinary tubes which are convoluted in their glandular or secreting portion pass straight or simply looped to the inner edge of the kidney, where they open on little projections, or papillæ, which are contained in several cup-shaped depressions in the expanded end (pelvis) of the duct to the bladder or ureter.

Bright's disease, usually associated with albumen in the urine, dropsy, and various secondary diseases, is of three different kinds :—

1. Inflammatory, affecting the urinary tubes.
2. Waxy, affecting the blood-vessels.
3. Cirrhotic, affecting the connective tissue ; but there may be a mixture of any two kinds.

A. Inflammatory, or acute Bright's disease, has three stages: 1st, inflammation of the cells lining the urinary tubes ; 2nd, fatty degeneration of the cells, which are washed out as tube casts ; 3rd, wasting of the kidney.

After exposure to cold, wet, intemperance, or some acute disease, especially scarlet fever, an individual has pain in the loins, frequent calls to pass urine, but makes little at a time, and that little of a dark smoky colour. The face and legs swell at first below the eyes and the ankles; breathing may be difficult, and there is more or less fever, with perhaps headache and drowsiness. When the disease is about to end fatally, the urine, and its dissolved solid contents more especially, decrease from the destruction of the secreting cells and blocking up of the urinary tubes. When much of the kidney is involved, death may take place within a fortnight. The urine deposits a sediment of blood, fatty or hyaline tube casts, and may all become solid when heated from the amount of albumen it contains. When recovery is about to take place, the urine increases enormously, the albumen decreasing and finally disappearing.

Treatment.—During the acute stage poultices to the back, cupping, which is done by patting a piece of blotting paper soaked in spirits of wine into the bottom of a glass, setting the spirit on fire, and applying the cup to the back, when the exhausted air causes it to adhere. Twenty drops tincture of digitalis and 10 grains acetate of potash twice a day, to increase the blood pressure and wash out the tube casts. Free action of the skin and bowels by half an ounce of cream of tartar daily in the drink, flannel clothing, abundance of bed-clothes; avoid cold; warm baths. The food should be rather small in amount, and consist of milk, beef tea, biscuit, and other farinaceous food. During convalescence, preparations of iron, 10 to 20 drops of the perchloride, or 4 grains of reduced iron three times a day after food. Avoid alcohol and preparations of mercury.

B. Waxy.—Is usually part of a general waxy degeneration in sufferers from wasting diseases, such

as death or ulceration of bone, causing long-continued suppuration, scrofula, etc. The patient feels increasing weakness, and begins to pass large quantities of pale-coloured urine, having to rise several times during the night. The ankles and below the eyelids become swollen. The proportion of albumen is at first small, but gradually increases. Shortness of breath and indigestion, with loss of appetite, or even loathing of food, with dry harsh skin, quick pulse, and increasing pallor of the skin, are among the earlier symptoms. Diarrhœa is common in the later stages. Waxy liver and spleen are found in 80 per cent.; waxy degeneration of the bowels in 50 per cent.; congestion of the lungs in 20 per cent.

Treatment.—For the cause, if possible; nourishing unstimulating diet, 4 grains reduced iron three times a day. For indigestion, 2 grains reduced iron, 2 grains pepsin, and $\frac{1}{4}$ grain strychnine. For diarrhœa, 30 drops aromatic ammonia and tincture of kino after each loose stool. Flannel clothing; avoid cold and preparations of mercury.

C. Cirrhotic or gouty kidney is the most hopeless, but has the longest continuance of all forms; it may last for many years. There is increasing weakness and pallor of the skin, which has a pasty appearance. Swelling of the ankles and lining membrane of the eye (Bright's eye), a chronic cough, and headache at the top of the head, with indigestion, and there may be one or more secondary diseases. Congestion of the lungs in 50 per cent.; hypertrophy of the heart in 46 per cent.; apoplexy in 17 per cent.; and disease of the interior of the eye (retinitis) in almost all. [See table.]

Treatment.—Outdoor exercise short of fatigue; nourishing diet; 4 grains reduced iron three times a day; blue glasses for the eyes; avoid cold and mercury.

Inflammation with Suppuration of the Kidney (Nephritis) may arise without apparent cause, or from exposure to cold, injuries, intemperance, irritating medicines, etc. The morbid action may cease, and health be restored, or it may go on to form one or more abscesses. When one kidney only is affected the symptoms are felt only on one side. There is severe pain in the loins, increased by exercise or pressure, the pain often extending along the ureter to the neck of the bladder and to the groin, with a feeling of numbness down the thigh. There is sickness and vomiting, shivering and fever; a quick, hard pulse. The urine is passed frequently, and is of a deep red colour, or more rarely pale; sometimes it is suppressed with convulsions. The bowels are constipated, and subject to colicky pains, and finally pus is passed in the urine.

Treatment.—Hot hip baths, fomentations, rest in bed. If there is no tendency to suppression of urine and convulsions, 10 grains compound ipecacuanha powder twice a day, sucking pieces of ice to allay the sickness, unstimulating diet—milk, tea, biscuit, and other farinaceous foods.

Dropsy of the kidney, in which a stone or tumour chokes the ureter, and the kidney finally becomes a mere shell. Cancer of the kidney and movable kidney often cannot be distinguished during life, even by good physicians, and are therefore omitted.

Blood in the Urine (Hæmaturia) may be from the kidney, bladder, or ducts (ureter and urethra). The urine is of a smoky, black, or port-wine hue, but no clots, if from the kidneys; clear, with blood and blood clots, if from the bladder. The most common causes are Bright's disease, cancer, stone, or some morbid poison in the blood. There is an intermittent form associated with malaria, and another form due to the presence of a small parasite in the veins of the kidney, the

Distoma hæmatobium, found in Egypt, South Africa, and the Mauritius.

Treatment.—Fifteen drops tincture of iron in half an ounce of glycerine, every four hours. When due to ague, 6 grains of quinine daily.

Suppression of Urine is a complete or partial suspension of the action of the kidneys, by which the urine is greatly diminished, or may be entirely suppressed. There may be some pain in the back, or irritability of the bladder, with sickness and hiccough; the body exhales a urinous odour, and in most cases, sooner or later, symptoms of poisoning by the retained urinary principles appear (uræmia). Children when teething may pass only a few drops of high-coloured urine, which stains the linen and causes scalding, making the child cry. Patients may recover after three to five, and even nine days' suppression of urine, and when death occurs it is usually by poisoning (uræmia) by the retained urinary principles, the symptoms of which are headache and vomiting, gradually increasing drowsiness going on to complete stupor, convulsions, or epileptic-like fits. The stupor goes on getting deeper till death occurs.

Treatment.—When the suppression does not depend on poisoning of the blood other than uræmia, an ounce of cream of tartar in water daily; if the pulse is small and quick, 5 drops tincture of digitalis, 40 drops spirit of nitre, and a drachm of solution of acetate of potash in a spoonful of water, every four hours. Vapour baths, warm drinks, and warm clothing.

Retention of Urine is when the urine is secreted but retained in the bladder, and may be caused by palsy of the muscular fibres of the bladder from any cause, usually from exposure to cold, from spasm of the urethra, from hysteria, and from various surgical causes, such as stricture,

pressure of a tumour or abscess, inflammation, or impaction of a stone. To distinguish retention from suppression the distended bladder may be felt in the lower part of the belly when no urine is passed from retention.

Treatment.—Retention caused by paralysis from cold and spasm is best treated by hot hip baths, or, if this is not convenient, hot fomentations and 10 grains of compound ipecacuanha powder. When due to hysteria, be in no hurry to use any remedies; sudden standing on a cold stone floor with the bare feet may succeed by inducing reflex action, but avoid prolonged cold to the feet, never longer than two minutes. The other forms, and all where there is prolonged or great distension, must be relieved by passing a catheter.

Incontinence of Urine (Enuresis), in the aged, may really be retention, the paralysed bladder becoming filled and the excess dribbling away constantly as it is formed; in middle age may arise from a great variety of causes: stone in the bladder, paralysis of the neck of the bladder, piles, etc.

In children who wet their beds it may be due to the irritation of worms in the bowel, weakly constitution, indigestion, etc.

Treatment.—For the aged, urine to be drawn off by catheter, and reduced iron 2 grains, pepsin 2 grains, strychnine $\frac{1}{12}$ grain, taken daily to give tone to the bladder. In middle age, if the cause can be ascertained, remove it; phosphate of iron 6 grains daily. For children, avoid giving much salt, sour or acid food, malt liquors, or spirits; restrict the quantity of fluid towards evening, and let none be taken for three hours before bedtime; let them sleep on hard mattresses with a moderate supply of clothing, have daily exercise in the open air and a daily cold tubbing. Prevent them sleeping on the back, say by tying a cotton reel over it,

which wakes them if they turn over. Attend to the general health; two grains reduced iron and 2 teaspoonsful of cod-liver oil daily. Five drops of tincture of belladonna should be given with 5 drops of tincture of iron three times a day to give tone to the bladder walls. Finally, punishing the child is not only unjust, but also useless, the affection being the result of disease or weakness.

Inflammation of the Bladder (Cystitis) is a severe disease, which may be due to extension of some other inflammation, or it may arise independently. It may be acute or chronic, suppurating or serous, extending over the whole bladder or only a part. In acute, the symptoms are shivering, pain and heat, a constant desire to pass urine, which comes away in small quantities and with pain, high fever, sickness, and vomiting; in severe cases delirium and exhaustion. When pus is formed, it is mixed with the urine which is passed. In chronic cases, which are more common and may be due to gout, extension of other inflammations, irritating urine, etc., the symptoms are often slight; there is a feeling of indisposition, tenderness of the walls of the bladder, which may sometimes be felt as a small, round, tender tumour, frequent passing of urine, which is scanty and contains pus.

Treatment.—In acute cases, opium 1 grain, extract of belladonna $\frac{1}{4}$ grain every four hours, till the pain is abated, hot fomentations, hip baths. A tablespoonful of castor oil, barley water, broth, linseed tea, or other mucilaginous drinks; avoid salt, spices, and spirits. In chronic cases, half-a-pint of infusion of (*uva ursi*) bearberry daily. If the urine is acid, alkalies, 10 grains; bicarbonate of soda twice a day before food; if alkaline, acids, 10 drops nitro-hydrochloric acid twice a day after food. Surgeons wash out the bladder by the aid of a catheter.

Stone in the Bladder (Calculus) may consist of uric acid, phosphate of ammonia and magnesia, phosphate of lime, oxalate of lime, etc. The symptoms are severe attacks of pain in the bladder, brought on or aggravated by exercise; frequent passage of urine, with a feeling that the bladder is not thoroughly emptied; the stream of urine is often suddenly stopped by the stone being forced against the neck of the bladder, but on making any movement it returns.

Treatment.—The only treatment of any avail is by operation. Bicarbonate of potash half a drachm twice a day may give some relief.

Urine.—The daily amount of urine passed in health is about two and a half pints, slightly acid, of a specific gravity of 1018 to 1020, and wine-yellow in colour. It contains about 14 parts in the thousand of urea, 4 uric acid, 10 parts of animal matter, and 8 parts salts, giving 33 ounces of solid to 1000 ounces of urine.

The colour of urine may vary from the darkest porter to the clearest water. A pale urine is generally copious; if of a reddish smoky colour it contains blood; if of a green colour it contains bile; bilious urine may be dark green, as black as porter. Albuminous urine is always light-coloured. Diabetic urine is of a slight milk hue; if pale clear, with a cloud of mucus at the bottom, having an ill-defined upper edge, suspect oxalates. If the density is above 1030, suspect sugar in the urine (see DIABETES, p. 121).

Chemical tests are:—

For *Albumen*.—Add a drop of nitric acid to about an inch depth of urine in a test tube; boil it over a spirit lamp. If there is albumen, there will be a white precipitate not dissolved by nitric acid.

Phosphates may give a white precipitate when boiled, but it dissolves in nitric acid.

For *Pus*.—When caustic potash is added, it becomes a thick, stringy mass.

For *Bile*.—Place a drop of urine and of strong nitric acid on a white porcelain plate, and tilt it a little till the liquids join, when there will be a brilliant play of colours.

For *Sugar* (see DIABETES, p. 122).

Under the microscope. In Bright's disease the different tube casts, in oxalic acid diathesis the crystals of oxalate of lime, and blood or pus corpuscles, etc., serve to confirm the judgment made as to the disease.

The urine may decompose in the bladder, but does not putrefy in the ordinary sense, if the urethra be healthy, till a catheter carrying germs has first been passed; hence catheters should always be rubbed with carbolic oil, 1 to 40.

CHAPTER VIII.

DISEASES OF THE SKIN.

DISEASES of the skin are often among the most difficult to recognise of all affections. Not only does the same eruption change its appearance during its progress, but there may be two or more separate affections of the skin at the same time. The affection should be closely examined in the different parts of the body where it presents itself, especially where it is just commencing. They are divided into (1) Pimples, (2) Scales, (3) Rashes, (4) Blebs, (5) Pustules, (6) Vesicles (small blebs), (7) Tubercles, (8) Spots.

GROUP I.

NON-INFECTIOUS DISEASES.

Erythema consists of distinct patches of some size of a uniform redness with puffiness of the affected skin, accompanied by little or no constitutional disturbance. There are several varieties: 1st, a fleeting kind due to derangement of the bowels; 2nd, light-coloured or dropsical legs; 3rd, from friction of folds of skin not frequently washed; 4th, in the form of a ring; but the most common form of all consists of red oval patches elevated above the skin, appearing generally on the front of the legs and arms, with the long diameter in the direction of the limb, and forming bumps about an

inch broad and an inch and a half in length. This variety is called *nodosum*, and is most common in young women and feeble boys, and accompanied by slight fever. After a few days the rose-red of the patches changes to a bluish colour, and the patches soften and gradually disappear.

Treatment.—One drachm compound rhubarb powder, afterwards 2 grains of quinine and 4 grains of carbonate of iron daily. Oxide of zinc powder dusted over the patches; if there is much pain, hot fomentations.

Roseola consists of small irregular red or rose-coloured patches distributed over the body and accompanied by slight fever. It may resemble scarlet fever or measles, but there is no sore throat or cold in the head. The duration is one to seven days.

Treatment.—A dose of Gregory's powder, 40 grains. If in teething children, lance the gums.

Nettle Rash (*Urticaria*) is an eruption of little *solid* elastic wheals, whitish in the centre and reddish at the edges, the appearance being exactly the same as that produced by the stinging of a nettle—hence the name. It is attended with intense itching and heat, with a burning, tingling, or prickling sensation, much like that produced by a nettle. It is often closely connected with derangement of the stomach, but may also be produced by influences acting on the nervous system, such as rheumatism and irritation of the womb. There is often fever, which may be severe. By far the most common cause is some error in diet, particularly shell-fish, and some vegetable substances; some kinds of food scarcely ever fail to produce it in certain individuals. The duration varies from a few hours to a few days, but in some cases it is chronic, and in such there may be an hereditary constitutional tendency to it.

Treatment.—At the beginning of an attack an emetic such as a tablespoonful of ipecacuanha wine, to empty the stomach of irritating matters, and followed in an hour by a drachm of compound rhubarb powder. Afterwards plain simple food, a stomachic mixture of soda and rhubarb three times a day before meals, and a lotion used to the affected surface of carbonate of ammonia 12 grains, acetate of lead 30 grains, tincture of belladonna half a drachm, and distilled or rain water 4 ounces. Rubbing the skin with slices of lemon and dusting it with oxide of zinc or with flour are other methods of treatment which have been used.

Lichen is an eruption of minute red pimples either distinct or arranged in clusters, accompanied by tingling, irritation, and often intense itching. When the pimples become excoriated they give vent to a serous fluid which forms crusts. There are five varieties :—

1. Simple ; where there is slight fever and itching or tingling. The eruption fades in about a week, and there is slight peeling of the skin. This form is apt to return every spring or summer in irritable constitutions.

2. Affecting the roots of the hair, often due to stomach derangements, especially from alcohol.

3. Clustered lichen. Irregularly circular patches with well-defined edges.

4. Severe form, in which there is considerable fever, and the pimples are much inflamed, seated on a hot, red, swollen skin. After a short time the inflammation diminishes, the skin becomes fissured, and exudes a serous fluid, forming thin scaly crusts. The itching, tingling, and smarting are intense.

5. Prickly feeling of heat, peculiar to tropical climates.

Treatment.—A lotion of equal parts glycerine

and water to the skin. A daily bath with 2 ounces of bicarbonate of soda to the gallon of water. Five grains of bicarbonate of soda in a tablespoonful of infusion of calumba three times a day, the soda to be increased by 3 grains more to each dose every day till 20 grains are taken thrice a day.

Red Gum—White Gum—is a form of lichen (small red pimples) in children which may appear on any part or extend over the whole body, and is due to derangement of the stomach from improper feeding or to irritation of the gums.

Treatment.—Careful diet; see particularly to the milk. Half a teaspoonful solution of carbonate of magnesia. Lance the gums if difficult teething is the cause. Glycerine lotion to the skin: one of glycerine to five of water.

Prurigo.—A chronic eruption of small pimples, the tops of which being scratched off, yellow or blackish crusts of blood and serum are formed, accompanied by intense itching and discomfort, often along with a sensation of creeping of insects over the skin. It attacks the scrofulous and weakly by preference, and is generally associated with errors in diet. Fissures of the skin which bleed and are very painful are a frequent complication usually where the skin is naturally in folds, as at the anus, angles of the mouth, joints, etc. The form which occurs in old age may last for the remainder of life.

Treatment.—Carbonate of magnesia 20 grains, sulphur 20 grains, bicarbonate of soda 10 grains, powdered ginger 3 grains, to be taken in a tumbler of milk in the morning. 5 drops of liquor arsenicalis twice a day, glycerine lotion, equal parts of glycerine and water. Sponging the skin with bicarbonate of soda, 2 ounces to a gallon of water, several times a day. An ointment composed of 1 drachm of

glycerine of subacetate of lead in 1 ounce of vaseline, I have seen relieve when other things have failed.

Psoriasis (Lepra) is a scaly disease, one of the most obstinate of all skin diseases, and is usually preceded and accompanied by acid indigestion, a dry skin, feeble circulation, and a tendency to gout. The eruption occurs in irregular red patches slightly raised above the level of the skin, and covered with thin dry white scales. The patches may be small spots, rings, or large patches, most frequently in the neighbourhood of the joints, especially the elbow and knee, and often accompanied by intense itching.

Treatment.—Five drops of solution, of arsenic twice a day after meals, till its effects are seen, and then stopped for a week. Five grains bicarbonate of soda in two tablespoonsful of infusion of gentian twice a day before meals. Tar ointment to the affected skin and a warm bath, with 2 ounces of bicarbonate of soda to a gallon of water, every day. Ointment of chrysophanic acid, 5 to 80 grains to an ounce, has been successful in cases of many years' standing that have resisted all other treatment. To be rubbed in for several minutes three times a day. If the disease is of any extent, the ointment at first should only be 5 grains to an ounce and gradually increased in strength, as it may produce intense irritation of the skin. The diseased skin should first be rubbed with a rag moistened with benzol and then washed with soap and water before applying the ointment. (Squire on Psoriasis.) The diet should be nourishing and free from stimulating articles.

Ichthyosis is a very rare disease, in which there are scales like a fish skin, forming a dirty grey coating over the backs of the arms and legs, but avoiding the hands, feet, bends of the knee and elbows. It is due to excessive growth of the scarf

skin, such as is seen in corns, and is usually hereditary, causing no inconvenience.

Treatment is often unavailing. Wear an india-rubber dress for three weeks, and rub the skin with a mixture of equal parts of glycerine and olive oil.

Herpes consists of clusters of vesicles or minute blisters upon inflamed patches of variable size. The eruption runs a definite course, rarely lasts more than three or four days, except in shingles, is not severe, and leaves no scar; it is frequently seen on the upper lip during a cold. The chief form is :

Shingles (Herpes Zoster).—A belt of skin on one side is felt to be tender and painful, but at first nothing is seen; in about a day, however, little red points are seen arranged in long oval groups on the painful part. Next day the red points have become covered with beautifully clear vesicles of a slight opal tint, situated on a red base. The size of vesicles varies from a pin's head to a pea. The eruption occurs along the course of a nerve, on one side of the body only, usually from the spine to the front of the body, forming half a belt, and is attended with stinging or burning pain and some fever. It usually lasts for about ten days when not interfered with, and may occur in either sex at any age without any special derangement of health.

Treatment.—Dust over the part with oxide of zinc powder. If the pain is severe, paint with a mixture of equal parts of aconite and belladonna liniments; if burning pain still continues, paint over with collodion containing 10 drops of glycerine and a teaspoonful each of aconite and belladonna liniments to the ounce.

Pemphigus.—Large blebs about the size of a marble occurring in successive crops, on a slightly reddened surface; the fluid contained is transparent or slightly yellowish, and after evacuation a thin

crust remains. It is sometimes attended with pain, heat, or itching, but often there are no apparent symptoms beyond the blebs. One attack may last for two or three weeks, and after a variable interval a second, third, fourth, and fifth may occur, or it may be chronic, a succession of blebs following each other till the death of the patient. Chronic pemphigus is a very fatal disease, the patient dying of exhaustion. It is a comparatively rare disease.

Treatment.—Good diet, 2 grains of quinine daily before breakfast. Three drops solution of arsenic, 20 drops tincture of iron, and 2 table-spoonful infusion of calumba daily after dinner.

Rupia.—Isolated blebs like pemphigus, but which last longer, and after bursting form a scab which gradually thickens by the addition of fresh exudation from ulceration of the skin, the successive layers forming a dark prominent scab, shaped like a limpet shell, beneath which is a foul ulcer which leaves a scar. It lasts from two to three weeks to several months, and occurs in weakly constitutions, especially in those contaminated with the poison of syphilis. It is not common.

Treatment.—Is according to the cause: if from a weakly constitution, quinine 2 grains, iron 20 drops of the tincture, and cod-liver oil a table-spoonful daily.

Eczema is one of the most common skin diseases, either alone or as a complication of others. A portion of skin becomes red, inflamed, and stiff with numerous minute vesicles, pimples, and papules, the scarf skin peels off, and a watery exudation, sometimes purulent or mixed with blood, pours out. The exudation stains and stiffens linen like starch and dries into crusts on the skin. There is itching, which is made worse by touching the part; at the same time there is an almost irresistible desire to

scratch. The skin has a doughy feel, and shows a yellowish hue on pressure. If a fold of skin be pinched up it feels thick and swollen, and when the disease is fully developed, the skin is brilliantly polished, red, shining, and has little exudations looking as if varnished. The causes are very various: direct irritation of the skin from any cause, a common one being excessive heat, obstruction of the circulation in the veins, and an hereditary or constitutional tendency are the principal causes.

Treatment.—Varies according to the cause. If the tongue is coated, the appetite bad, and the stools clay-coloured, 2 grains of calomel every second day till four doses are taken. If the patient is florid and a full feeder, 1 drachm of sulphate of magnesia twice a day in a glass of water. If weakly or scrofulous, nourishing food, a table-spoonful of castor oil daily, 2 grains of quinine, with 4 grains of carbonate of iron daily for six weeks. When the disease is acute, and the skin red and raw-looking, a lotion of subacetate of lead and calamine applied frequently agrees well; afterwards ointments of zinc oxide, oleate of zinc, red oxide of mercury, etc., do well. Locally, warm baths. For subacute cases a lotion of glycerine 1 ounce, water 3 ounces, sulphate of zinc 20 grains. A lotion of nitrate of silver 2 grains to the ounce is one of the best to relieve the severe itching.

Ecthyma.—An eruption of large round pustules about the size of large peas rising from a bright red hard inflamed base and attended with sharp cutting pain and fever. The pustules are not very numerous, and contain a yellowish purulent fluid, often mingled with blood, succeeded by dark-coloured scabs which leave red stains, disappearing after a time, or if the scabs continue, sometimes they leave slight scars. They occur on the neck,

shoulders, buttocks, limbs, or chest, seldom on the face and neck. The cause may be direct irritation of the skin, as by tartar emetic ointment, irritation of lime in masons, of red-hot sparks of iron in blacksmiths, but more commonly it is due to a feeble state of general health, when there are successive crops of pustules with small ulcers under the scabs leaving a scar. It is not a very common disease.

Treatment.—The acute form, usually of only one crop, requires no treatment beyond removing the cause. The chronic form of ill health requires nourishing food and 2 grains of quinine daily, with 2 grains of reduced iron three times a day, and oxide of zinc ointment locally.

Acne.—Red pimples occurring chiefly on the skin of the forehead, temple, and nose, most frequently after puberty. Almost every one has suffered from it more or less. The pustules are due to obstruction of a sebaceous duct, the secretion of which accumulating causes inflammation, the resulting pustule of which may go on to suppuration and bursting leave minute hard red tumours. The first indication of the affection is often the accumulation of secretion in the sebaceous ducts, the end of which becomes dark-coloured and is popularly thought to be worms in the skin. A severe form of acne (Rosacea) often occurs in tipplers, especially in spirit-drinkers, and in women at the change of life, in which the face may become one red mass, the pimples touching each other and rising from a blue-red base. On the nose of spirit-drinkers it often forms small knobs and projections of a purplish-red colour, giving a very unsightly appearance.

Treatment.—Food should be simple and nourishing, avoiding wine, spirits, tea, and coffee. Bread and milk poultices locally, with an ointment of iodide of sulphur 15 grains to an ounce of lard.

Wash the face with sulphur soap and use considerable friction when drying every day.

Corns consist of a growth of the scarf skin caused by the pressure or friction of tight or badly-fitting boots or shoes. A corn not only lies on the true skin, but its pressure causes the true skin to waste, and the corn fills up the space, thus penetrating into the skin. Soft corns are those situated where the secretions of the skin are confined, as between the toes—keeping the corn moist and soft.

Treatment.—Soak the feet in warm water, with 2 ounces of bicarbonate of soda to the gallon, for half an hour, then pare the corn or raise it from the edge with the point of a knife; in the centre will be found a white spot or root, going deeper in; pick it out with the point of a knife, and afterwards wear a piece of plaster with a hole in the centre over the middle of the corn. If complete rest can be had for four days without putting on boots, burn it with nitrate of silver (lunar caustic). Hard corns on the sole of the foot are best treated by repeated filing with a rasp. Perhaps the best of all remedies as corn-removers is the salicylic paint, sold by several chemists under different names, but which consists of salicylic acid 30 grains, extract of Indian hemp 5 grains, collodion half an ounce. Apply with a brush every day after well soaking the corn.

Cut soft corns off close with a pair of scissors; afterwards wear a piece of lint dipped in solution of acetate of lead between the toes, or, if it can be had, a fresh ivy leaf every day. Both hard and soft corns may be removed by repeated applications of acetic acid.

Bunions are a painful swelling of the bursa or sac over the joint of the great toe, usually caused by the pressure of tight or ill-fitting boots or shoes. The pain, redness, and swelling soon subside on

removal of the cause, but a permanent enlargement is usually the result.

Treatment.—A bread poultice, and afterwards a plaster spread on soft leather. Both corns and bunions require an instant change to properly fitting easy shoes or boots.

Warts are a collection of enlarged papillæ of the true skin covered by a scarf skin. They generally appear on the hands without any obvious cause, and are not painful.

Treatment.—Salicylic paint used every day as directed for corns will quickly get rid of them, or they might be touched every day with strong acetic acid, first paring off the decayed part, or a thread tied tightly round the base gets rid of it at once.

Freckles are yellowish or brownish-yellow spots, which appear especially on fair skins and those exposed to the sun; they cause no annoyance and have no bad result. To get rid of them sponge the skin night and morning with a lotion of solution of chlorinated soda half an ounce, glycerine an ounce and a half, and water 10 ounces. Lemon juice and water or a mixture of equal parts lime water and oil, with 5 drops solution of ammonia to the ounce, have also been used effectually.

Boils are small hard painful swellings on the skin which go on to suppuration. A red angry-looking spot appears at first, which gradually enlarges into a swelling with a whitish centre surrounded by a hard inflamed base; after a time it suppurates and discharges a fibrous mass of dead skin, forming the core, and which is the cause of the boil; till it is discharged—and it often lies deep, causing great pain—the abscess will not heal. Sometimes boils follow in rapid succession for a considerable time, occurring more usually in the strong and robust, and are due to errors in diet or living, such as insufficient pure air.

Treatment.—Poultices till the boil softens, and then an incision to let out the pus. A piece of belladonna plaster at the beginning placed over the part sometimes prevents the formation of a boil; drawing a moistened stick of nitrate of silver twice over the spot may also prevent its formation. Nourishing diet for weakly persons, avoiding stimulants. A drachm of sulphate of magnesia in a tumbler of water every second day for full-blooded persons. Two tablespoonsful of infusion of quassia and 2 grains of quinine daily for all cases where there is a succession of boils.

Chilblains are a kind of low inflammation caused by sudden changes from cold to heat, especially in weakly persons of languid circulation, in children, scrofulous people, and old age. A chilblain begins with swelling, slight purplish redness, pain and itching, and may go on to form a blister, followed by ulceration.

Treatment.—Before the chilblains are broken rub them gently with a lotion of alum and sulphate of zinc 1 drachm of each, spirits of wine half an ounce, and water 4 ounces. If they have broken dress them with spermaceti ointment. To prevent chilblains nothing equals brisk exercise; for children free use of a skipping rope. Friction of the hands and feet with a rough towel after washing till they are thoroughly dry. Avoid damp feet and sudden warming of the hands and feet when cold. Wear woollen socks and gloves.

GROUP II.

INFECTIOUS SKIN DISEASES.

It is difficult to get the fungus of the different parasitic skin diseases to grow, but it is equally difficult to extirpate when it does grow.

Ringworm is an affection of the hairs of the skin, scalp, or chin, usually of a circular or ring shape. The hairs become dry, brittle, and tend to crack across or break off. At first there is itching with slight redness of the skin, which becomes covered with fine white powdery scales. The affection is due to the growth of a fine white powdery fungus (*Trichophyton tonsurans*) which grows in the interior of the roots of the hair. The hairs swell, become paler and brittle, breaking off close to the head. The hair follicles inflame and suppurate, killing the fungus in them, but also killing the hair bulb and leaving permanent baldness. There are three forms, one attacking the body (*Tinea circinata*), another attacking the beard (*Tinea sycosis*), and causing acne pimples, a third attacking the scalp (*Tinea tonsurans*), which is generally met with in children.

Treatment.—The essential point is to destroy the fungus, and to get at it for this purpose it is necessary to pull out the affected hairs with a pair of tweezers, and then, after daily washing with soap and water, apply a piece of lint soaked in a lotion of equal parts of glycerine and sulphurous acid and covered with a piece of oiled silk. As the epilation is a rather painful process, several ointments have been used to rub into the patches, such as ointment of nitrate of mercury of the British Pharmacopœia diluted with lard 10 per cent., or ointment of oleate of copper (very useful) and the oleate of mercury 5 per cent. for children under eight, and 10 per cent. for children over that age. But nearly every case of ringworm of scalp is very troublesome and takes months to cure. If obstinate, chrysophanic ointment, 20 grains to the ounce, may be used. The general health must be attended to, as the fungus grows more rapidly when the health is not good.

Favus is a disease caused by the growth of a fungus (*Achorion Schönleini*), usually attacking the scalp and forming small dry sulphur-yellow cups or crusts, each containing a hair in its centre and resembling a piece of honeycomb. Like ringworm, it begins in the hair follicles, but outside the sheath, and is attended with severe itching, the hairs becoming brittle and falling out, and is accompanied by a mouldy odour compared to the smell of mice. Sometimes it grows beneath the nails, and gradually eats through them, a yellow cup appearing in the opening.

Treatment.—As in ringworm, is directed to destroy the fungus. Shave the head three times a week, when possible, apply poultices till the crusts come off, then apply tar ointment twice a day, washing off the preceding supply of ointment each time with soft soap and soft water. The disease is very common among mice, and infection is not unfrequently from them.

Bald Spots (Tinea decalvans). Round or oval bald patches on the scalp, perfectly smooth and white, by many supposed due to a fungus (*Microsporon Audouii*).

Treatment.—The same as for liver spots.

Liver Spots (Pityriasis versicolor) are brownish-yellow or yellowish-brown-coloured spots on the body or arms, which are covered with small branny scales, and are due to the growth of a fungus (*Microsporon furfur*).

Treatment.—Wash twice a day with soft soap and water, and use a lotion of equal parts of sulphurous acid and glycerine.

Itch (Scabies).—Consists of an eruption of little pimples or vesicles from the irritation caused by the burrowing underneath the scarf skin of the itch insect. It attacks the delicate parts of the skin most, between the fingers, the wrists, bends of

the joints, armpits, etc. The first thing noticed is itching, increasing at night and followed by the appearance of the eruption. The eggs are laid in burrows made in the scarf skin, and are hatched in eight days, the burrows appearing like fine scratches from a small needle. Itch also infests sheep and dogs.

Treatment.—Is directed to destroying the itch insect and its eggs. If there is much irritation of the skin warm baths. At bedtime scrub the whole body except the head with black soap (soft) for half an hour, take a hot bath for another half-hour, then after drying rub all the body except the head with sulphur ointment for twenty minutes, and let it stay on all night, wash it off with a hot bath in the morning; repeat this process for two more nights, when the cure ought to be complete. All clothing must be scalded with boiling water or ironed with a hot iron, as one insect escaping destruction might set up the disease again.

GROUP III.

RARE DISEASES.

Molluscum.—Consists of tumours the size of a pea to a pigeon's egg, projecting from the skin sometimes from a narrow stalk. There are two forms, one of which is contagious, severe, and chronic, the cysts of which are filled with soft matter like thick gruel.

Treatment.—Open the cysts and apply nitrate of silver to the inside, or, if only a narrow foot-stalk, cut them off.

Keloid.—A thick raised, tender patch of skin, an inch or more in diameter, which may resemble the scar of a burn or the shell of a tortoise. There may be only one or several.

Treatment.—Arsenic, iron, and iodide of potassium, with cod-liver oil; 5 drops solution of arsenic, 10 drops tincture of iron in a tablespoonful of cod-liver oil, and 3 grains of iodide of potassium daily.

The following tables may assist in distinguishing the different skin diseases.

I.—Pimples (dry at first).

LICHEN.	PRURIGO.	ACNE.
Minute red pimples accompanied with itching and tingling, skin harsh and dry; after a time in severe forms a clear serous exudation, and may also have bleeding fissures and crusts of secretion. Fissures occur where the skin is naturally in folds, joints, angles of the mouth, etc. (Common.)	Scattered flat pimples and small black scales. Skin is thick, flabby, dirty, and there is severe itching. (Common.)	Small isolated pimples, most of which suppurate and burst, leaving hard red tender pimples. Occur chiefly on the forehead, temples, and nose. (Very common.)

II.—Dry Scaly Diseases.

PSORIASIS.	ICHTHYOSIS.	LIVER SPOTS.
<p>Elevated patches of skin covered with dry pearly white scales. If a fold of skin is pinched up it feels thick, and under the scales the skin is of a tawny red colour. In the scalp it differs from eczema in not gluing the hairs together. Occurs chiefly around the elbows and knees. Syphilitic on the palms and soles of the feet.</p> <p>(Common.)</p>	<p>The whole skin of the affected part is dry, hard, thick, and horny like strong fish scales, beneath which the skin is white. No pain or itching.</p> <p>(Very rare.)</p>	<p>The skin is of its natural thinness, covered with minute branny scales. The skin beneath the scales is not red. Slight itching. In the scalp it differs from ringworm in not being circular. Produced by a fungus, <i>Microsporon furfur</i>.</p> <p>(Rare.)</p>

III.—Rashes.

ERYTHEMA.	ROSEOLA.	NETTLE RASH.
<p>Raised red patches of skin attended with some heat and itching, colour disappearing under pressure. Occur most frequently on the face, chest, and limbs.</p> <p>(Common.)</p>	<p>Irregular patches of sore red skin attended with slight fever and itching and sometimes sore throat. May resemble scarlet fever, but the fever is less.</p> <p>(Common.)</p>	<p>Smooth red or white patches like that produced by a nettle, attended with burning, tingling, and itching.</p> <p>(Common.)</p>

ITCH.	SWEAT VESICLES.	HERPES.	ECZEMA.	PEMPHIGUS.
A mixture of small vesicles and pimples with intense itching, worst when warm in bed. Occurs chiefly on the thinnest parts of the skin between the fingers, on the wrists, and bends of the joints. Produced by the itch insect. (Common.)	Numerous little clear vesicles, like dew drops, which shrivel and dry up in three or four days. No other symptoms or effects. (Very common.)	A number of large clear vesicles, the size of a coriander seed to a pea, situated on an inflamed base, and which burst, and are scab, and are not reproduced. Vesicles are largest in shingles forming a belt half round the body. (Except shingles most common on the lips.) (Very common.)	Begins with transparent vesicles the size of a pin's head, sometimes as large as a small pea. The skin is yellowish-red, thick, stiff, and has a doughy feel when pinched up. Sometimes there are a multitude of cracks, and after a time it looks shining as if varnished with an abundant clear starchy secretion, which may dry up into yellow crusts. (Very common.)	Large vesicles size of a marble, clear at first, becoming milky, burst and leave a thin scaly scab, which falls off leaving no scar. (Rare.)

V.—*Pustules.*

ECTHYMA.

Large round isolated pustules on a hard, red, inflamed basis. The pustules burst and form hard, thick scabs.

(Rare.)

RUPIA.

Large vesicles like pemphigus, but flatter, which become purulent, burst, and form thick scabs, which slowly increase, appearing like limpet shells, and having deep ulcers underneath leaving a scar. It is most frequently due to syphilis.

(Rare.)

VI.—*Affecting the scalp and parts covered with hair, produced by growth of a fungus.*

BALD SPOTS.

At first the skin is wrinkled and slightly reddened, but soon becomes white in an oval or circular patch, perfectly bald, and surrounded by the thick neighbouring hair. (*Microsporon Audouinii*.)

(Not uncommon.)

RINGWORM.

Circular patches on the scalp with dull dry hair broken off short as if shaved and covered with fine white powdery scales. On the skin the patches are red in colour (*Trichophyton tonsurans*). A severe form in Poland is produced by a fungus (*Trichophyton sporuloides*) affecting the beard; it is attended with pustules.

(Common.)

FAVUS.

A number of dry circular sulphur-yellow crusts depressed in the centre with a hair in middle of each. The hairs are dull, dry, looking, and easily pulled out. There is some itching and a peculiar mouldy smell like that of mice.

(*Achorion Schönleini*.)

(Not uncommon.)

PART III.

DISEASES AND MANAGEMENT OF CHILDREN.

CHAPTER 1.

SECTION I.—MANAGEMENT OF CHILDREN.

Cleanliness.—An infant should be tubbed once a day, the body being immersed in the water. Inattention to washing is a frequent cause of chafing of the skin; soap should not be used every day because it combines with, and washes away, the natural oily secretion which keeps the skin soft and supple. The salts of perspiration can be washed away with pure water (soft is preferable), and the excess of oily secretion may be removed by using soap twice a week; frequent use of it leaving the skin harsh and dry. The water should be of the temperature of new milk. Many persons use cold water and scanty clothing with the idea of making their children hardy, which it certainly does—by killing off the weaker ones. The child should not be long in the bath, and as in all bathing, the skin should be thoroughly and quickly dried with a soft napkin. With older children upwards of four years of age cold water may be

used with advantage, except in winter, when the chill should be taken off, and rubbing with a soft towel after the bath, but very delicate children may be unable to benefit by cold bathing at any age.

For exercise a child may be safely trusted to take as much as is good for it, and should spend a considerable time in the open air at play, except in wet or cold weather.

Clothing should be loose, warm, and light; with delicate children fine flannel should be worn next the skin, and no pins, except safety pins, should be used in the dress of infants. The head ought to be kept cool, hence soft pillows and night-caps should be eschewed. The dress ought to come up to the neck; one part being unprotected is more apt to give cold than insufficient clothing over the whole body. The evil custom of keeping infants and young children in frocks with short sleeves is one that cannot be too strongly opposed. It makes them very liable to catch cold, from the blood, which is constantly passing down the arms, getting chilled. Instead of hardening the child, as it is termed, it more often is the beginning of frequent attacks of bronchitis, which lead to other and more lasting effects on the lungs. Often a child, who is apparently healthy when born, becomes in time a chronic invalid by this means. If the mother has the frocks with short sleeves by her, she only needs to get the small knitted woollen jacket sold by all drapers and put it on over the frock. When changing from a warm room to the cold air additional clothing ought to be put on, but the habitual clothing and heat of the room ought not to be such as to excite perspiration or cause relaxation of the skin, as the first exposure to cold air is sure to give a cold.

The essentials for health of infants and children

are plenty of pure air for the lungs, sufficient good milk for the stomach, plenty of sleep for the brain, and plenty of water for the skin.

Food.—The diet of the infant is indicated by nature with unerring wisdom. The changes in the mouth show when a change to other food than milk is desirable. From birth till seven months of age, when the teeth begin to appear, the mother's milk should be the only food, provided it is sufficient in quantity and good quality. A mother generally suckles her baby too often, a practice which is injurious both to the mother and child; the over-feeding causes indigestion (see p. 295), and the child is consequently in pain and cries, which is too frequently quieted by giving it the breast again. It is a great mistake to consider an infant's crying as a sure sign of an empty stomach. Crying is the infant's only method of expressing all disagreeable sensations: if it is hungry it cries, if over-fed it cries, if held too long in one position so as to cause undue pressure on one part, if exposed to cold, if its dress is too tight, if pricked by a pin, or if exposed to too bright a light or a very loud sound, it cries, when generally the same universal remedy is used—applying it to the breast. An infant should have its food at regular intervals, just as adults should: for the first month every hour and a half during the day, and thrice during the night, for the second month every two hours during the day. When the milk is not sufficient in quantity, cow's milk, or tinned milk, may be also given. When an infant is brought up by hand the unmixed milk of one cow should be used with a third part added of water and slightly sweetened so as to resemble the mother's milk. The first and second months it will require $\frac{1}{4}$ of a pint, the third and fourth months $\frac{2}{3}$ of a pint, after the fourth month one pint daily, slowly increased, till after the

sixth month it will require 2 pints a day. The importance of proper food given at regular intervals cannot be too strongly impressed on mothers. I have too often seen the wrecks of children brought about by nothing but improper starchy foods. The usual reason given is "that my baby was not satisfied with the milk," but the real reason is not that they are not satisfied, but that they are fed too often, causing indigestion and flatulence, with their several results, vomiting, diarrhoea, etc. If good cow's milk cannot be had, the Swiss milk (milkmaid brand) or Nestle's are good substitutes,—beware of other brands, as they are generally skimmed milk—but Swiss milk does not usually answer after three or four months of age. Sometimes it may be preferable to begin with one of the patent foods not containing starchy materials, such as the malted food of Mellin's, which is perfectly free from starchy matter, or Benger's food, which is digested in the process of cooking. Either of these do admirably from birth, and can be continued for any length of time. No bread, corn-flour, arrowroot, biscuits, rusks, or any of the favourite starchy foods of mothers should be given until the child is more than six months old, and then only in small quantities. After seven months of age, on an average, the infant should begin to take small quantities of other food than milk, such as dried bread-crumbs rubbed to a fine powder and baked in a slow oven to a light fawn-colour, or thin slices of bread covered with cold water and baked in an oven for two hours, then beaten up with a fork and slightly sweetened, or the crust of a loaf boiled for one hour, broken up with a fork, and slightly sweetened, or baked flour, fine flour baked in an oven till of a light fawn-brown; it has a constipating tendency, and hence is best used mixed with one half its weight of good oatmeal. Corn-flour may also be used in various ways. All

the foregoing are best given freshly prepared and mixed with some milk. The proportion of farinaceous food should be gradually increased till the infant is nine months old, when on an average it should be weaned, prolonged suckling being hurtful both to mother and child, especially to the mother. Weaning should be gradual, a sudden change being injurious to the child, and not less so to the mother. For the first three years the food should be farinaceous only, rusk, arrowroot, sago, rice, bread-crumbs, and the like with milk; animal food, such as soups, should only be given as articles of medicine. During the first seven years farinaceous food, such as bread, the lighter vegetables with animal soup or broth, a mealy potato, and milk, should be the staple food, tender chop or steak being occasional varieties. After the seventh year, when the permanent teeth begin to appear, a due mixture of the various kinds of food is best. Children often overeat themselves when tempted with toothsome dainties, but if, like *Oliver Twist*, after dinner they "ask for more," they should have dry bread with milk, of which they will take what they really require, and be in no danger of over-eating. Youths of both sexes require more food than adults, the growth of the body requiring to be provided for in addition to the food needed for sustenance.

Sleep.—For the first three months an infant's time is almost entirely spent in sleep; it awakens when hungry, and being fed goes to sleep again. For the first two months it should sleep with its mother for the sake of warmth, an infant's power of generating heat being very feeble, but after two months of age it is best to let it have a separate bed, by which it is less disturbed and has more certain access to pure air. No noise or talking should be allowed, because, even though it does not wake the child, it renders the sleep disturbed and

unrefreshing. A piece of light muslin may be laid over the cradle to keep off flies and dust, but thick cloth must be avoided because it prevents a sufficient supply of pure air. The room should be quiet and darkened during the day-time by closing the shutters. The length of time required for sleep gradually gets less as the child gets older, but till the growth is completed more sleep is required than afterwards. As long as the sleep is sound and refreshing it is not too long and is required, but dozing between waking and sleeping does more harm than good.

Teething.—As a rule an infant begins to cut its teeth at seven months of age, and is generally two years in cutting the whole set of milk teeth, usually in the following order: 1, the two lower front teeth (incisors); 2, the two upper front teeth; 3, the two upper teeth on each side of the front pair; 4, two lower side incisors; 5, the two lower first grinders; 6, the upper first grinders; 7, the lower canine teeth; 8, the upper canine or eye-teeth, then the lower back grinders, and finally the upper back grinders; but very often the teeth do not follow this order. About seven years of age the milk teeth begin to fall out and are succeeded by the permanent teeth, which are thirty-two in number. Two more on each side of one jaw between the grinders and the canine or eye-teeth called the bicuspid teeth, and an extra grinder on each side called the wisdom teeth because they are not usually cut till after twenty years of age. The first indication of the approach of teeth is a flow of saliva which trickles from the angles of the mouth. When an infant is in good health and not over-fed, which is a fruitful source of difficult teething, the eruption of the teeth is comparatively easy. Slight feverishness occurs for a day or two before each tooth appears, and sometimes the whole milk set appear without

any trouble whatever. If teething go on naturally there is no occasion for interference; the child should have an india-rubber ring to bite on, the pressure of which hastens the absorption of the gum over the approaching tooth. In painful teething the child is peevish and fretful; the face is flushed, and the skin hot; the child puts its fingers and everything it can reach into its mouth. If a tooth or teeth can be felt in the gum nearly through so that they would probably appear in a day or two, the gum lancet may be used to divide the gum over the tooth in the length of the gum and not across, but usually friction of the gums with the finger and a little syrup of roses will suffice. In severe teething the gums are red, hot, and swollen, and cannot be touched without pain; the mouth is dry; the child is restless, feverish, and starts in its sleep; the head is hot and heavy, and it may have convulsions, purging, flatulence, cough, or other disorder caused by the irritation of the teeth pressing on the gum. The gums should at once be lanced, and the child put into a warm bath at 98° F. for ten to twenty minutes, when it should be taken out and thoroughly dried.

During teething certain eruptions on the head are apt to appear, especially behind the ears; if they are moist a little flour or violet powder may be dusted over them. When very dry a little glycerine will relieve the disagreeable or painful irritation; should they continue after teething is completed, an alkaline lotion may be used twice a day, such as half a drachm of carbonate of soda to 6 ounces of soft water. Among the more frequent diseases during infancy are convulsions, chafings, flatulence, looseness of the bowels, gripings, red gum, vomiting, and thrush.

SECTION II.—DISEASES OF CHILDREN.

Chafing of the Skin is usually caused by insufficient use of water. The part ought to be well sponged with tepid water, and dried with a soft napkin, and afterwards sprinkled with some fine powder, such as powdered starch, violet powder, wheat-flour, fuller's earth, oxide of zinc, etc.

Convulsions are alternate states of rapid contraction and relaxation of the muscles, especially of the limbs, accompanied by unconsciousness. Great differences in the liability to convulsions exist in different children; in some families convulsions are unknown, while in others not a single child escapes. The causes are very numerous, but much the most common are irritation of teething or a disordered state of the bowels, either from worms, too much food, indigestible food, unhealthy secretions, or quacking with drugs. All causes which tend to impair the general health favour the occurrence of convulsions, such as impure air, improper diet, etc. When a child previously in perfect health, and not known to be taking, or to have taken, indigestible food, becomes affected with convulsions, an attack of an eruptive fever, especially measles, scarlet fever, or small pox, may be suspected. If the child be closely watched before the attack comes on, the eyelids will be seen to be imperfectly closed during sleep; there will be occasional twitchings of the face, and sudden startings with moanings or screams. When the fit comes on, it generally begins with the muscles of the face, the twitchings of which are more decided than formerly, and in a few seconds the head and neck are drawn backwards, and the limbs, perhaps only on one side of the body, are bent and stretched out. The child is now unconscious and free from pain, the eye is fixed with a contracted or dilated pupil immovable to light, so that a finger

or a light may be brought near the eye without causing winking, and hearing is also lost, so that the loudest sound does not startle. The surface of the body is warm, and profuse perspiration pours out; the pulse is quick and weak, the breathing hurried, and during the fit the bladder or bowels may be emptied; sometimes vomiting occurs. The average duration of the attack in infants is from five to twenty minutes; when the fit subsides the child falls into a deep sleep, or may open its eyes apparently bewildered, or may have a fit of crying.

Treatment.—As soon as the child is noticed to be twitching, place it in the blanket saturated with hot water, as explained at p. 171 (see INFANTILE CONVULSIONS); it is quicker and much less likely to excite the child than the hot bath so frequently used; place cold cloths to the child's head, keeping them saturated as often as they dry, every few minutes. If the gums are hot and swollen let them at once be lanced; if some indigestible food has been taken give a teaspoonful of ipecacuanha wine, repeated if necessary in ten minutes till vomiting occurs; after it comes out of the fit a teaspoonful of castor oil may be given to clear the bowels, and great attention paid to its diet. In suckling infants the mother or wet nurse must be careful as to her food and general habits.

Cries of Infants in Illness.—When an infant is dangerously ill, it seldom cries, so that when it begins to cry a great deal during severe illness it is usually a sign of amendment. When a child suffers from inflammation of the lungs, it moans, but rarely cries; when suffering from bronchitis, the cry is gruff and rattling; when suffering from croup, the cry is hoarse, ringing, often crowing. When teething, it is sharp and fretful; when hungry, fretful and wailing. In carache it is sharp and piercing, and in inflammation of the head (water brain fever) it is a piercing shriek.

Flatulence occurs chiefly in infants that are hand-fed (see INDIGESTION, p. 289), and may be temporarily relieved by a teaspoonful of dill water and gentle friction over the bowels with a warm hand and some olive oil. In very severe flatulence a warm bath gives immediate relief, and may be followed by 10 grains of compound rhubarb powder. Avoid all soothing syrups and quack remedies which contain opium, as all are exceedingly dangerous to children.

Griping.—The cause may proceed either from the infant or from the mother, and in either case is generally due to improper feeding. The child screams violently and draws up its legs: it turns away from the nipple, and strains as though it were having a stool; when it has a stool it will be slimy, curdled, green, or watery.

Treatment is a warm bath followed by 3 grains of compound rhubarb powder in a teaspoonful of dill water for a child under six months. A powder of mercury and chalk (grey powder) with rhubarb, 2 grains of each, is one of the most useful powders for infants suffering from griping pains and diarrhœa, with straining due to undigested food or milk. It can be given twice or three times a day if necessary. In very young infants 1 grain of each will be sufficient. Avoid all quack medicines as being dangerous, as also opiates and astringents.

Loose Bowels (Diarrhœa) is one of the most common and serious diseases of infants. An infant should have from three to six motions in twenty-four hours of a bright yellow or orange colour, with very little smell, and of the consistence of thick gruel; if the number of motions is increased to from six to eight in the twenty-four hours, and the child is otherwise well, it should not be interfered with, but if it lasts more than three days, give 5 grains of compound rhubarb powder to a child one year

of age, and, if the looseness still continues, 10 grains of the aromatic powder of chalk may be given every four hours in a teaspoonful of dill water, and grey powder and rhubarb should be given twice a day. If at the breast, the child must not have any artificial food, and if not, milk preserved in tins is the most suitable food, with lime water added, one tablespoonful to a bottleful of milk.

Diarrhœa in infants, if long continued or severe, may give rise to a false appearance of hydrocephalus. (See p. 142.)

If the character of the stools change (the attack becoming one of dysentery), from a dozen or more frothy or like boiled sago to blood and mucus, with violent straining and griping, twisting and writhing, sickness and vomiting, frequent screaming, rapid wasting and exhaustion, the treatment requires to be different. Let the child be put in a warm bath at the commencement of the disease, and afterwards put a flannel bag filled with hot bran over the bowels, and let it have a teaspoonful every four hours of the following mixture: 10 drops of laudanum, 2 drachms of castor oil, 4 drachms of dill water, and 3 drachms each of syrup of oranges and mucilage of gum-acacia. Avoid giving any opening medicine except the above small amount of castor oil and opium.

Red Gum consists of numerous little red pimples about the size of pins' heads, and may be distinguished from measles, the only thing it is at all likely to be mistaken for, by its lighter colour, by the pimples not being arranged in crescent-shaped patches, and by the absence of the symptoms of a cold in the head. The cause is usually irritation of teething, and requires no treatment except there be considerable irritation, when a dose (10 grains) of compound rhubarb powder may be given. Avoid draughts.

Thrush consists of irregular milk-white patches inside the mouth, on the tongue and the angles of the mouth, and on the lips, and is caused by the growth of a fungus. Under the white patches the skin is red and inflamed, but not ulcerated, the mouth is hot and painful, and the child is afraid to suck. Occasionally the thrush extends into the bowels. The treatment, if the child is not suckled, is in the first instance great attention to cleanliness as regards the food; tinned milk, or quite fresh milk (procured fresh at all events, to be used at least twice a day. Locally honey and borax to the white patches, and 3 grains of borax with 2 grains of sugar to be put on the tongue every four hours.

Vomiting.—If the child is in good health it is due to over-suckling, and it should get less in consequence. If the vomiting continue for more than a few hours the child should be given only a very small quantity at a time of milk and lime water, but repeated at short intervals until the stomach becomes less irritable and can retain larger quantities.

In these cases a great deal depends on the judgment of the mother or nurse as to the quantity given; but careful watching of the child soon finds out how much at a time will be retained. The child will be eager for drink; but this craving must be resisted, or the stomach will continue to empty itself, and much more trouble will ensue. Do not be afraid to use plenty of lime water in every case. If it does not thrive, the milk may not be good, and the mother should attend to her own health and habits; or the child may be teething.

In almost all the painful affections of infancy a warm bath is of use; warmth rightly applied in different ways is a whole pharmacoepœia of itself, with the great advantage of very seldom doing any

harm, and generally does much good. All the other diseases of infancy beyond the special ones already mentioned must be treated in accordance with the ordinary treatment of the diseases, and will be found each under its own heading.

CHAPTER II.

OLD AGE.

THE natural termination of life is by a process of gradual decay in which all the parts of the body become old together, so that, like the Deacon's one-horse shay sung by Lowell, the termination ought to be a sudden falling to pieces all over. However, both in coaches and in men, one part does wear out first. A man's age is not always to be measured by his years, for some are aged even in their youth, while others are strong, vigorous, and youthful till well on in years. As age comes on, whether in middle life or in advanced years, the tissues of the body begin to degenerate. "Degenerations are such changes as may be seen to take place naturally towards the end of life. The new material is lower in structure, that is, nearer inorganic matter; thus fat is lower than any nitrogenous organic compound, gelatin is lower than albumen, and earthy matter is lower than all. The degenerated part is lower in structure than the preceding structure; thus the crystalline form in bones and oil globules for muscular fibre. In its function it has less power, and in its nutrition there is less frequent and active change, and there is no capacity of growth or development, all of which is the result of defect of nutrition, and not of disease.

"The result of senile atrophy (wasting) is not the same in all persons: you may class them into the lean and the fat."

“Some people as they grow old seem to wither and dry up, sharp-featured, shrivelled, spinous old folk, yet withal wiry and tough, clinging to life and letting death have them, as it were, by small instalments slowly paid; such are ‘the lean and slippered pantaloons,’ and their shrunk shanks declare the pervading atrophy. Others, women more often than men, as old and as ill nourished as these, yet make a far different appearance. With these the first sign of old age is that they grow fat, and this abides with them till, it may be in a last illness sharper than old age, they are robbed even of their fat. These, too, when old age sets in, become puffy, short-winded, pot-bellied, pale, and flabby: their skin hangs not in wrinkles, but in rolls; and their voice, instead of rising to childish treble, becomes gruff and husky.” (Paget.)

Treatment.—Rest, warmth, easily soluble food, not requiring much chewing and easily digested, in small quantity at a time. An even elevated temperature and the exclusion of the sun’s rays, as in the “dim religious light” of a closed bedroom, will enable life to go on slowly for a marvellous period. The dishes of meat should be as soft and tender as possible, and the firmer kinds should be finely cut, but vegetables should not be over-softened in cooking. The aged require less sleep than formerly; but if the shortening of sleep goes too far, a little food such as a biscuit or sandwich, and in some cases a glass of wine, just before going to bed, tends to procure sleep (by drawing blood from the brain to the stomach). Loss of appetite or disgust for food is always a serious symptom in old people, and is usually the first sign of a sudden break-down, what may be called acute old age. (Dr. Chambers.)

CHAPTER III.

LOCAL INJURIES AND EMERGENCIES.

Abscess (Gathering) is a collection of pus (the yellow creamy secretion of inflamed wounds is pus) in the tissue below the skin or in some internal organ or cavity. Abscess may be acute, which is the ordinary form, or chronic, usually associated with scrofula. Acute abscess (boils and styé are small abscesses) generally depends on a disordered condition of the blood, and is a frequent sequence of fevers. The symptoms are feverishness, with heat, throbbing pain, bright redness, and swelling of the part, which is firm in the centre and sodden around. The formation of pus is indicated by abatement of the fever and a change in the pain, which is less acute, consisting more in a feeling of tension; the swelling becomes softer and loses its bright red colour; the centre feels soft, with a ring of hardness round it, and round the hardness it feels sodden. As the pus increases the abscess begins to point—that is, to project in the shape of a cone, which gradually becomes more prominent; the skin over it becomes of a dusky red, or bluish, till it finally gives way, and the pus escapes.

Treatment.—A large poultice. If the abscess points without becoming larger in circumference, it may be left to burst of itself, but if it increases in breadth without pointing it should be opened at once.

Chronic abscesses, if large, may be emptied with a trocar and india-rubber tube, as in tapping (p. 439); if small, they may be opened in the usual way. The general health should be attended to. (See TREATMENT OF SCROFULA, p. 118.)

Bleeding.—When bleeding occurs from a cut or wound, it should be arrested not by a cloth or bandage applied at large over it, but a small part folded up to the size of the wound should be laid over it, another slightly larger over this, and then a bandage of any kind. A slight force stops bleeding if properly applied. When an artery is wounded the blood spurts out in jets, and is light scarlet; if a vein is wounded it flows out continuously, of a dark colour. A large wound or cut artery in a limb is most easily and thoroughly stopped by a piece of india-rubber tube pulled tightly round the limb five or six times. If a small artery is cut across, it stops bleeding after a short time, but if it is merely wounded, it may go on bleeding till the patient bleeds to death. The bleeding from a cut artery may be stopped by pressing on it with the point of a finger, and with very little force if the artery can be pressed against a bone. No time should be lost in procuring the assistance of a surgeon, as prolonged pressure for more than twenty-four hours from a tube or bandage would cause death of the limb. If a surgeon cannot be had, an attempt must be made to tie the artery: the wound should be opened and the bandage or tube relaxed till the blood spurts out, when the bleeding point should be grasped with a pair of tweezers or anything available—a sugar-tongs might do in default of better—and a thread tied firmly round the bleeding point below the grasp of the tweezers. The thread should make only one turn round the artery, and is best tied with a reef knot. The edges of the wound may be brought together

by plaster or sewing the skin with white silk thread or silver wire. Bleeding from small wounds, such as leech bites, may be stopped by touching them with a stick of nitrate of silver (caustic).

Bruises.—In all injuries and inflammations the first requisite is rest to the part. If fainting has followed the infliction of a bruise, the patient should be kept lying down, and a small amount of wine or brandy cautiously given. In less severe injuries when swelling, pain, and stiffness are the worst results, hot fomentations, and a lotion of dilute solution of subacetate of lead, with 4 grains of opium to half a pint of lotion. When the pain has subsided, an evaporating lotion should be used of chloride of ammonium (sal ammoniac), 4 grains to an ounce of soft water, with half a drachm of spirits of wine. Tincture of arnica is commonly used, but the effect is due to the spirit it contains. A bruise appears red for a short time, while the blood poured out remains fluid, but it soon changes to a black colour as the blood clots, and after a time becomes successively blue, violet, green, and yellow before disappearing, from the red corpuscles of the blood breaking down and setting free the contained colouring matter.

Burns and Scalds.—Burns are produced by heated solids, scalds by heated liquids. The danger is in direct proportion to the amount of skin affected, an extensive slight burn being more dangerous than a severe small burn. The best application is a continuous bath of cold water with a pound of bicarbonate of soda to a gallon of water, into which the limb should at once be plunged, and kept in it for some hours, or the body clothes dipped in the cold water and soda should be applied; if the pain and shock continue extreme, 30 drops of laudanum in a glass of wine or brandy may be necessary. When blisters form and become tense, *some* of the

fluid should be let out by pricking the blister with a needle. After removal from the cold bath the limb should at once be wrapped in a thick layer of cotton-wool, which acts as an antiseptic filter to the germs in the air, and also prevents rapid changes of temperature, which are always trying to weakened parts. As in all inflammations, the part must be kept absolutely at rest. When the part goes on to suppuration it should be dressed twice a day with strips of lint soaked in a mixture of equal parts of linseed oil and lime-water shaken up together to form an emulsion—that is, the oil dividing into fine particles and forming a thick fluid. Cream is a natural emulsion of butter, the separate particles of which contain the butter in a fluid or melted state, and which does not become solid till the surrounding membrane is broken by churning or chemical changes. A still better application in many cases is olive oil with one-fortieth part carbolic acid—that is, about a teaspoonful of carbolic acid to ten tablepoonsful of olive oil may be used. If olive oil is not at hand, linseed oil. In small burns such as of the fingers, one of the best applications is a stiff paste of whiting or fine chalk and water applied at once like a small poultice, and kept on for a day till all pain ceases.

Choking.—If a person has choked on a piece of food, try to get it out with the fingers put well into the back of the throat; if this cannot be done, and there is danger of suffocation, it may be pushed gently down into the stomach, while the head is held back with the face looking slightly upwards, which is best done (apart from surgical instruments) by a piece of whalebone, such as the rib of an umbrella. A smart pat on the back in less serious cases may suffice, but the sensation of something sticking in the throat remains for some time after it has gone into the stomach. When a hard

substance such as a coin is swallowed and sticks in the throat, which not uncommonly happens with children, turn the child bodily upside down, holding it by the legs, and let another slap it on the back; if this fails, an attempt may be made to snare the substance with a loop of fine wire.

Cuts.—If not clean cut with a knife, any glass, hairs, or dirt should be removed and the edges of the cut brought together and kept so by a piece of sticking-plaster or of bandage; but the wound must not be completely covered by the plaster; one or two thin strips should be applied to bring the edges together, and a pad of wet or dry lint should be placed over it and changed once a day. An old-fashioned but excellent covering is a leaf of arnica with the smooth side to the cut and bound with a piece of rag. Arnica grows freely in this country, and in some parts is popularly called "healing leaf."

Dislocations and Fractures.—Dislocation is when the end of a bone is removed from its position in a joint. Fracture is when a bone is broken; if an end projects through the skin, it is a compound fracture. The sooner the bones are replaced the better and the more easily is it performed. If a surgeon cannot be procured till several days elapse, endeavour gently to replace the bones in their natural position, comparing the injured side with the sound one, and when this has been done apply a piece of wood as a splint, well padded with cotton-wool, and pass many turns of a bandage round the limb and splint firmly, but not over the seat of fracture, and not so tight as to cause any pain or compression of the limb. Several folds of moist brown paper, which hardens as it dries, make a very good and well-fitting splint, but the limb must not be moved till it has time to dry. Keep the limb perfectly at rest and await the arrival of the surgeon.

Fainting is a sudden loss of consciousness and strength from a temporary diminution or suspension of the heart's action. The direct causes of fainting are numerous and various, among the most common being strong emotions, such as fright, surprise, grief, distressing or revolting sights, severe pain, such as that of a blow, bruise, or burn, overpowering odours, or heated crowded rooms. Fainting from the preceding causes is due to failure of the contractile power of the heart from loss of nerve power (sympathetic ganglia). Sudden loss of blood or valvular disease of the heart may cause fainting from diminution of the blood pressure (*syncope*), which is often dangerous. Fainting may occur quite suddenly, but usually it is preceded by a feeling of sickness or uneasiness at the stomach (*nausea*), swimming in the head, or mental confusion.

The first sensation is generally a ringing in the ears, the sight becomes confused and the senses deadened, the face becomes deadly pale, a clammy perspiration breaks out over the body, and the person sinks to the ground helpless and motionless. Breathing is interrupted, and the pulse cannot be felt at the wrist. This condition, which resembles death, lasts from a few seconds to a few minutes, when the patient draws a breath, consciousness returns, and with it the power of movement and colour to the lips and face.

Treatment.—Place the patient lying down on his back, with the head on a level with the body; loosen all tight articles of dress at the throat, chest, and wrists; secure the access of fresh cool air; hold ammonia (ordinary smelling salts) or strong acetic acid to the nose. Whenever the patient is able to swallow, give some warm brandy and water, or aromatic ammonia (*sal volatile*) in water. For other conditions of unconsciousness see Index—"Insensibility."

Sea-sickness is similar to the sickness induced by rapid turning round or swinging, and is accompanied by vomiting, and is often attended with headache. The predisposition to sea-sickness varies very much; some persons are never affected, the great majority suffer at the beginning of a voyage, the sickness subsiding after a time, while some remain always liable to it. Generally stout persons suffer more severely than thin persons.

Treatment.—The influence of the mind is very important; a resolution not to be sick goes a long way to prevent it, while a feeling that it must come on soon leads to it. One of the best ways of counter-acting sea-sickness is to lie down in the open air, with the eyes engaged in reading, or closed to prevent seeing the motion of surrounding objects. Some persons have a slight feeling of sickness even from watching the motion of a railway train, as when seated in one train while another beside it begins to move, the person not knowing which train is moving. Vomiting is rendered easier by having something of a light nature in the stomach, such as a glass of lemonade or soda-water, to which a little brandy may be added. A little chloroform, such as four drops on a piece of sugar, sometimes restrains the vomiting. Several drugs have been advertised as curative agents, but I have always found the citrate of caffeine the most useful and successful.

Sprains are produced by the over-stretching or tearing of the muscles, tendons, or ligaments in the neighbourhood of a joint, often attended with severe pain, swelling, and discoloration. The great remedy is complete rest for days to save weeks or months of disablement. Sprains comparatively slight at first may by using the limb be greatly aggravated and prolonged. A severe sprain is often very much longer in healing than a broken

bone. I have known slight sprains where the limb was persistently used at first to last over a year. The treatment is to apply a padded splint secured with a bandage at the very first. If there is much pain and swelling, warm fomentations, and afterwards when these have subsided cold bathing.

Whitlow is an inflammation and abscess of the finger. There are two kinds—1. *Superficial*, where the inflammation is in or beneath the skin; it is attended with burning or throbbing pain and formation of pus. 2. *Tendinous Whitlow*.—The inflammation is in the sheath of the deep tendons or sheath of the bone (periosteum). The symptoms are fever, accompanied by intense bursting pain and tenderness, but not much swelling in the finger, though it may run up the arm.

Treatment.—The superficial form is treated like any other abscess by poulticing and opening when required, along with which a dose of opening medicine, such as 60 grains of compound rhubarb powder, should be taken, and, if necessary, tonics, such as 4 grains of citrate of quinine and iron twice a day. The tendinous or deep form of whitlow to be freely opened at once, not waiting for the formation of pus; if not opened the inflammation will be followed by death of the tendons or of the bone, leaving a crippled finger. The knife must touch the bone to make sure of opening the inflamed sheath, and so relieve the tension.

Wounds.—Cuts or lacerations which have become inflamed and do not heal at once must be kept at perfect rest, constant cleanliness must be maintained, and the wound covered by a piece of lint dipped in carbolic oil, 1 to 80, which may be renewed every day. The principles of treatment are to give rest, protection from the air, and cleanliness. Rest allows the tissue cells to grow for the repair of the injury; protection from the air

prevents the access of germs ; cleanliness prevents the accumulation of a soil for their growth. Strips of lint dipped in plain cold water and frequently renewed, say three times a day, often give excellent results.

Drowning.—The following are part of the excellent rules of the Royal National Lifeboat Society for the restoration of the apparently drowned :—

I.

Send immediately for medical assistance, blankets, and dry clothing, but proceed to treat the patient *instantly* on the spot, in the open air, with the face downward, whether on shore or afloat ; exposing the face, neck, and chest to the wind, except in severe weather, and removing all tight clothing from the neck and chest, especially the braces.

The points to be aimed at are—first and *immediately*, the restoration of breathing ; and secondly, after breathing is restored, the promotion of warmth and circulation.

The efforts to restore breathing must be commenced immediately and energetically, and persevered in for one or two hours, or until a medical man has pronounced that life is extinct. Efforts to promote warmth and circulation, beyond removing the wet clothes and drying the skin, must not be made until the first appearance of natural breathing ; for if circulation of the blood be induced before breathing has recommenced, the restoration to life will be endangered.

II.—TO RESTORE BREATHING.

To Clear the Throat.—Place the patient on the floor or ground with the face downwards, and one of the arms under the forehead, in which position all fluids will more readily escape by the mouth,

and the tongue itself will fall forward, leaving the entrance into the windpipe free. Assist this operation by wiping and cleansing the mouth.

If satisfactory breathing commences, use the treatment described below to promote warmth. If there be only slight breathing—or no breathing—or if the breathing fail, then—

To Excite Breathing. - Turn the patient well and instantly on the side, supporting the head, and excite the nostrils with snuff, hartshorn, and smelling salts, or tickle the throat with a feather, etc., if they are *not* at hand. Rub the chest and face warm, and dash cold water, or cold and hot water alternately, on them. If there be no success, lose not a moment, but instantly proceed to imitate breathing by Dr. Silvester's method, as follows:—

Artificial Respiration.—Place the patient on the back on a flat surface, inclined a little upwards from the feet; raise and support the head and shoulders on a small firm cushion or folded article of dress placed under the shoulder-blades.

Draw forward the patient's tongue, and keep it projecting beyond the lips: an elastic band over the tongue and under the chin will answer this purpose, or a piece of string or tape may be tied round them, or by raising the lower jaw the teeth may be made to retain the tongue in that position. Remove all tight clothing from about the neck and chest, especially the braces.

To Imitate the Movements of Breathing.—Standing at the patient's head, grasp the arms just above the elbows, and draw the arms gently and steadily upwards above the head, and keep them stretched upwards for two seconds. [By this means air is drawn into the lungs.] Then turn down the patient's arms, and press them gently and firmly for two seconds against the sides of the chest. [By this means air is pressed out of the lungs.]

Repeat these measures alternately, deliberately, and perseveringly, about fifteen times in a minute, until a spontaneous effort to respire is perceived, immediately upon which cease to imitate the movements of breathing, and proceed to induce circulation and warmth.

III.—TREATMENT AFTER NATURAL BREATHING HAS BEEN RESTORED.

To Promote Warmth and Circulation.—Commence rubbing the limbs upwards, with firm grasping pressure and energy, using handkerchiefs, flannels, etc. [By this measure the blood is propelled along the veins towards the heart.]

The friction must be continued under the blanket or over the dry clothing.

Promote the warmth of the body by the application of hot flannels, bottles, or bladders of hot water, heated bricks, etc., to the pit of the stomach, the arm-pits, between the thighs, and to the soles of the feet.

If the patient has been carried to a house after respiration has been restored, be careful to let the air play freely about the room.

On the restoration of life, a teaspoonful of warm water should be given; and then, if the power of swallowing has returned, small quantities of wine, warm brandy-and-water, or coffee should be administered. The patient should be kept in bed, and a disposition to sleep encouraged.

GENERAL OBSERVATIONS.

The above treatment should be persevered in for some hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance, persons having been restored after persevering for many hours.

APPEARANCES WHICH GENERALLY
ACCOMPANY DEATH.

Breathing and the heart's action cease entirely; the eyelids are generally half closed, the pupils dilated; the tongue approaches to the under-edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus. Coldness and pallor of surface increase.

CAUTIONS.

Prevent unnecessary crowding of persons round the body, especially if in an apartment.

Avoid rough usage, and do not allow the body to remain on the back unless the tongue is secured.

Under no circumstances hold the body up by the feet.

On no account place the body in a warm bath unless under medical direction, and even then it should only be employed as a momentary excitant.

CHAPTER IV.

POISONS: THEIR EFFECTS AND TREATMENT.

SECTION I.

CHRONIC POISONING; CUMULATIVE POISONS (continuous small doses produce an increasing effect).

GROUP I.—ORGANIC POISONS.

Alcohol: Delirium Tremens.—Morbid effects produced by the slow and cumulative action of alcohol. Delirium may appear after a long course of tippling, or after a single protracted debauch. The first indication of commencing delirium is usually complete sleeplessness. The patient becomes pale and chilly, and gets into a busy, but not violent delirium, which is worse at night. He is excited, eager, restless, and sleepless, and becomes timid, suspicious, and jealous of all around him; he imagines that his business is ruined, his friends plotting against him, that there are listeners outside the door, under the bed, or concealed by the curtains. He may make violent efforts to escape from imaginary danger or enemies. If he sleeps for a short time he is haunted by frightful dreams, causing him to scream out in terror. He is constantly muttering and talking, and suffers from various hallucinations; thus he says he sees rats and mice running over the bed-clothes, or seas of flame advancing to destroy

him; he is surrounded by legions of spirits, the famous blue devils; and shrieks, raves, prays, and curses, all in one breath. The tremulous tongue is coated with a thick creamy fur; there is complete loss of appetite, sickness, and constipation; there is trembling of the muscles and tendons, so that he cannot hold out his hand steadily when requested to do so; the skin is cool, and exhales a peculiar spirituous odour; the pulse quick and weak, and there is general mental and bodily prostration. In favourable cases there is sound sleep, lasting for twelve or more hours, when he begins to recover, generally in 48 to 72 hours from the commencement. In fatal cases the sleeplessness continues; the delirium becomes low and muttering; he lies picking the bed-clothes with trembling fingers and constant twitchings of the muscles, which gradually passes into stupor and death usually between the third and seventh day.

Treatment.—The danger is from exhaustion, and the treatment is directed to preserve the strength till the alcohol has time to leave the system. The patient should be kept in a cool, quiet, darkened room, and never left alone. Restraint is rarely necessary, and is to be avoided from irritating the patient and increasing his excitement. The food must be nourishing, and given often—milk, yolk of eggs, beef tea, soups, and the like, spiced with Cayenne pepper. Small pieces of ice may be swallowed to soothe the irritability of the stomach, and half an ounce of cream of tartar, dissolved in boiling water and flavoured with sugar and lemon, given as a drink daily for the first two days. Four grains of Cayenne pepper should be given daily, either in soup or pill, and to procure sleep, as much as 20 grains, or half a small teaspoonful, is of use in the early stages. Opium is to be avoided, and when given at all, it is in very small doses and

in long-continued cases, but bromide of potassium and chloral are nervine sedatives which are useful in quieting restlessness and causing sleep.

Digitalis (*Common Foxglove*).—When given medicinally it accumulates in the system, unless precautions be taken, and may cause death from sudden stoppage of the heart. Patients taking it should not exert themselves, and should keep lying down, if a large quantity has been taken, till it has had time to pass off. It should always be given with a diuretic.

Ergot: Ergotism.—Ergot is a fungus which grows chiefly on rye and wheat (cockspur), and when ground with the grain and eaten for some time it produces convulsions, mortification of the fingers or toes, and death, or continued ill-health. The mortification begins in one or both feet, with pain, redness, and a burning sensation which ceases suddenly after some days, and is replaced by a feeling of cold. The part affected becomes black as charcoal and dry as tinder. This effect is due to the action of ergot causing contraction of the small arteries, and the mortification resembles that of old age produced by choking of the arteries from atheroma.

Treatment.—Find out and remove the source of the ergot, usually bad bread. Give a purgative to remove all in the bowels, such as half an ounce of cream of tartar; afterwards tonics and stimulants and opiates to soothe the inflamed parts and relax the contracted vessels, such as chlorate of potash 20 grains, carbonate of ammonia 5 grains, laudanum 10 drops, infusion of calumba two tablespooful; to be taken three times a day.

Strychnia.—After some time it causes sudden twitching of the muscles and starting of the limbs during sleep so as to awaken the patient.

Treatment.—All that is required is to stop taking it.

GROUP II.—INORGANIC POISONS.

METALS.

Arsenic.—Chronic poisoning with arsenic usually occurs among workmen who have to do with it, or accidentally from green wall papers, etc. It produces a long and varied train of symptoms, the first of which are itching and swelling of the eyelids, redness of the white of the eyes (conjunctivæ), sickness, and uneasiness at the pit of the stomach, sometimes also vomiting, and a peculiar white, silvery appearance of the tongue, which is seldom accompanied with tenderness. Some constitutions can become accustomed to the poison, and are not injured by doses which would be certainly fatal to most people; thus there is a race of arsenic-eaters in Styria who, beginning with small doses, gradually increase them till they take an enormous amount, and not only do not suffer from it, but are said to have stronger and better health in consequence.

Treatment.—Find out the source of the arsenic; if in green wall papers or dresses, etc., and stop it. Iron tonics, such as 10 drops of the tincture of iron, three times a day.

Antimony.—Produces great depression of the circulation and system generally. The symptoms are not unlike typhoid fever, sickness, vomiting, purging, extreme weakness, and fatal exhaustion. Externally applied, it causes pustules on the skin.

Treatment.—Stop taking the poison and use iron tonics, such as 6 grains of the carbonate daily.

Brass Founders' Ague.—Is a peculiar intermittent fever occurring among brass founders and those exposed to the fumes of zinc. The paroxysms occur irregularly, with tightness at the chest,

towards evening shivering, an indistinct, hot stage, and profuse sweating.

Treatment.—Two grains of quinine daily, and free use of milk. An emetic (a teaspoonful of ipecacuanha wine when the attack comes on) followed by 5 grains of quinine.

Chromates.—Workmen in factories where chromates are used are subject to a peculiar ulceration and loss of the cartilage-forming division between the nostrils.

Treatment.—Stop working with chromates and take 10 drops of dilute sulphuric acid in a glass of water, three times a day.

Copper.—Workers in copper are subject to copper colic (see COLIC, p. 321); the attacks of pain come on suddenly, and are made *worse* by pressure. The pain is of a twisting or griping character, and is often accompanied with sickness and vomiting. The face has an anxious expression, and has a peculiar sallow colour, the eyes are sunken, and the lips livid, and there is a green or purple colour round the gums.

Treatment.—Two drachms of sulphate of magnesia, and 2 drops of dilute sulphuric acid in a tumbler of water, twice a day. A mustard poultice over the belly for ten minutes, and 20 drops of laudanum to relieve the pain. The bowels are not usually confined.

Iodine.—The first effects are a pricking pain in the eyes and running over of tears, a flow from the nose like a common cold (coryza), pricking pain at the pit of the stomach, and general depression.

Treatment.—Stop the dose and take iron tonics, such as 10 drops of the tincture of iron, three times a day.

Lead-colic and Palsy.—May be produced by drinking water which has stood for some time in leaden pipes, as well as by handling preparations of

lead. There is impaired digestion, wasting, and sallowness of the skin, with ulceration and a peculiar blue or slate-grey line round the margin of the gums, but absent wherever there is a tooth missing. Occasional attacks of colic occur along with thirst, vomiting, tenderness over the belly, severe grinding or twisting pain round the navel, which is relieved by firm pressure, great prostration, cold sweats, and giddiness. The constipation may last from three to fifteen days, but as soon as the bowels act the severity of the attack lessens, and the disease generally terminates within a week. When palsy occurs, which generally requires a larger dose than will produce colic, it first attacks the muscles of the hands and arms; the extending muscles of the hands and arms become paralysed so that when the arms are stretched out the hands hang down by their own weight, hence it is called wrist-drop. The muscles of the ball of the thumb waste, and there are cramps of the joints with repeated attacks of colic. The course of the palsy is always long; it often lasts many months or even years. If lead is taken in by the skin from ointments, many months, and even years, may be required to produce its poisonous effects. The lead becomes combined with the various organs and tissues of the body, most being found in the spleen and liver, and it passes very slowly off by the urine.

Treatment.—A drachm of sulphate of magnesia, 5 drops of dilute sulphuric acid, and 20 minims of tincture of hyoseyamus in two tablespoonsful of camphor water, every two hours, till the bowels are moved, and afterwards three times a day for five days. Three grains of iodide of potassium daily, and 5 grains of citrate of iron, twice a day.

Mercury.—Workers with mereury, such as gilders, are frequently affected, generally from inhaling the vapour. The effects are profuse flow of

saliva, sometimes amounting to pints, swelling of the tongue and salivary glands, ulceration of the gums and membranes of the mouth, with a blue or dark red line at the junction of the gums and teeth, loosening and brittleness of the teeth, and even death of parts of the jaw, fœtor of the breath, excessive purging, with bilious stools, colicky pains, great wasting and bloodlessness, inflammation of the membranes of the bones, low fever, and great prostration, neuralgic pains, trembling, paralysis, and sometimes convulsions with failure of the mental powers.

Treatment.—Remove from the influence of mercury, either as vapour or swallowed; iodide of potassium, 3 grains daily; white of an egg in water, thrice daily; iron tonics, such as 10 drops of tincture of iron, in a tablespoonful of infusion of quassia, three times a day, after food. Good nourishing diet, warm clothing, and fresh air.

Phosphorus.—Burning pain at the pit of the stomach, fatty liver with jaundice, and when prolonged, death of part of the lower jaw-bone.

Treatment.—Abstain from handling phosphorus.

Silver Nitrate.—Long-continued use stains the skin an indelible leaden hue.

SECTION II.

ACUTE POISONING. Generally by one large dose.

1. The symptoms appear suddenly while the individual is in health.

2. Symptoms appear soon after a meal or after eating or drinking.

3. When several partake of the same food or medicine containing poison, all suffer from the same symptoms.

GROUP I.—INORGANIC POISONS (GASES AND VEGETABLE ACIDS).

Acids (Mineral).—Sulphuric, Nitric, and Hydrochloric Acids.—Large dose causes death on the average within 24 hours: have a sour taste and cause a burning pain in the mouth and throat when swallowed in poisonous doses, followed by excruciating pain in the stomach, eructations, vomiting of brownish or blackish matter; swallowing is painful or impossible, there is intense thirst, anxious face, small quick pulse, catching, laboured breathing, scanty urine, confined bowels, and straining. The mouth is white and shrivelled, yellow or brown and corroded; if the sufferer recovers he may remain a dyspeptic for life from a destruction of a part of the lining of the stomach.

Treatment.—Magnesia in milk, chalk or whiting in milk, plaster knocked out of a wall suspended in milk, olive oil, soapsuds, bicarbonate of soda or potash in water, any alkaline (soda, potash, lithia, ammonia). The antidotes should be given freely diluted for some hours; magnesia (heavy oxide) is best where it is at hand, but if not, the first that can be had should be given at once.

Acids (Vegetable).—Oxalic Acid and its Salts, sold as Salts of Lemon, Sorrel, etc.—The symptoms are variable: an intense sour taste, burning pain at the stomach, increased on pressure; constriction at the throat, purging and vomiting tinged with blood, and the general symptoms of weakness and collapse. Death has been caused by less than half an ounce, and may occur within ten minutes.

Treatment.—Chalk suspended in milk, magnesia, plaster from a wall suspended in water, lime water, oil; carbonates of soda and potash not to be used.

Tartaric and Citric Acids.—Are poisonous in large doses, from irritation of the stomach.

Treatment.—Chalk, magnesia, or bicarbonates of soda and potash, diffused or dissolved in water.

Hydrocyanic or Prussic Acid, like ammonia, is a vapour which for use is kept dissolved in water. It is also contained in cherry-laurel water, oil of bitter almonds, and cyanides or prussiates of potash.

A large dose may cause death in two to five minutes, smaller ones within an hour. The symptoms are loss of consciousness, difficulty of breathing, with snoring sounds and convulsions.

Treatment.—Dilute chlorine gas to be inhaled, cold water to be poured in a stream on the head from a height of three feet till consciousness returns.

Alkalies.—*Caustic Potash and Soda, Strong Ammonia, Potashes and Pearlashes, Carbonates of Potash and Soda.*—Symptoms are a strong acrid, burning taste in swallowing, followed by acute pain and great tenderness at the pit of the stomach, increased by pressure, along with frequent vomiting of brownish matter, violent colicky pains, swelling of the belly, purging of stringy mucus mixed with blood, difficulty of swallowing, hoarseness of voice and cough succeed. In cases which become chronic the sufferer may die of starvation from stricture or narrowing of the throat.

Treatment.—Vinegar and water, lemon juice and water, acid drinks, oil, which forms a soap with the alkali.

Gases.—*Carbonic Acid.*—Carbonic acid gas, when mixed with air, does not act as a poison, but causes suffocation from want of oxygen. When persons fall into an old well, or brewer's vat, in which carbonic acid gas accumulates, a temporary expedient for rescuers would be to breathe through freshly-slacked lime; spread the lime on a towel and place a small basket on it, round which draw the edges of the towel and breathe from a short

piece of pipe ending in the basket. The lime combines with the carbonic acid to form carbonate of lime, and leaves the oxygen in proper quantity. This does not apply to fumes of burning, as colliery explosions, limekilns, etc., owing to the presence of carbonic oxide, which is unaffected by the lime. The usual symptoms of poisoning by carbonic acid are a sense of weight in the forehead and back of the head, tightness in the temples, violent headache, giddiness, ringing in the ears, dimness of sight, drowsiness, hurried breathing, violent palpitation, sickness and vomiting, followed by insensibility, slow pulse, snoring breathing, pale and livid or lead-coloured face. In drowning it gives rise to pleasurable sensations and early delirium.

Coal Gas, Carbonic Oxide, Charcoal Fumes, etc., are chemical poisons.

Treatment. Is artificial respiration and a free draught of cold air.

Irritant Gases.—*Vapour of Sulphuric, Nitric, and Hydrochloric Acids, with Chlorine and Ammonia,* when breathed for any length of time, unless largely diluted, may cause death by exciting fatal inflammation of the air passages.

Treatment.—For the vapours of the acids breathe dilute ammonia, the vapour over an ordinary smelling-salts bottle; for chlorine, very dilute sulphuretted hydrogen; for ammonia, steam of vinegar and hot water.

Sulphuretted Hydrogen Gas.—Is a very active poison, less than two volumes per thousand destroying life. The gas has the peculiar offensive odour of rotten eggs, or washings of a gun barrel. The symptoms are giddiness, tightness across the forehead, sickness, weakness, cold skin, delirious convulsions, and tetanus.

Treatment.—Inhale very dilute chlorine gas, which can be made by pouring some dilute acid on

common bleaching powder, so-called chloride of lime.

Metals.—*Arsenic and its Salts.*—Symptoms begin within an hour or so of its being swallowed, and consist of burning pain at the pit of the stomach, increased by pressure, with sickness and vomiting, renewed by the act of swallowing, constriction of the throat, intense thirst, inflammation and smarting of the eyes, headache, violent beating of the heart, quick pulse and frequent, catching breathing, great weakness, restlessness, convulsive twitchings in the limbs and cramps, but usually the mind is unaffected. The symptoms of arsenic-poisoning, however, are liable to great variations.

Treatment.—An emetic, followed at once by hydrated oxide of iron in large quantity, and which may be produced by pouring ammonia into a bottle of tincture of iron.

Antimony and its Salts.—Tartar emetic is the most common preparation. Symptoms are a strong metallic taste in swallowing, with heat, constriction, and soreness of the mouth, followed by sickness, vomiting, pain and tenderness over the belly, and succeeded by severe cramps, cold skin, clammy sweat, small quick pulse, great weakness, and sometimes convulsions.

Treatment.—Tincture of cinchona, large quantities of strong tea, decoction of oak bark, or anything containing tannin.

Salts of Barium.—The same symptoms as mineral acids, with the addition of violent cramps and convulsions, headache, excessive weakness, dimness of sight, and double vision.

Treatment.—An emetic, followed by dilute solution of sulphate of magnesia or soda.

Copper and its Salts.—A quarter of an hour or more after swallowing the poison colicky pains, sickness, eructation, vomiting of bluish or greenish

matters, purgings, cramps, sometimes convulsions, palsy, and insensibility come on.

Treatment.—White of egg in water, milk, wheat flour and water.

Sulphide of Potassium (Liver of Sulphur) produces the same symptoms as mineral acids, with the addition of convulsions or stupor, and the odour of sulphuretted hydrogen gas.

Treatment.—Dilute solutions of chloride of soda or lime (bleaching liquids).

Silver (Lunar Caustic).—Treatment is to swallow common salt dissolved in water; if not at hand, white of egg, milk, or wheat flour.

Tin and Zinc.—White of egg, milk, magnesia, wheat flour, chalk, soapsuds, dilute solution of carbonate of soda.

Minerals. — *Alum. Bleaching Powders and Liquids.*—Give an emetic if vomiting is absent, and follow with copious draughts of water.

Iodine and its Preparations.—Treatment is starch that has been boiled, either common starch, boiled potatoes, bread, flour and water, or any bread stuff after being scalded with boiling water.

Lime (Caustic).—Swallow carbonic acid, the most convenient shape being a bottle of soda water, or drink dilute sulphuric acid.

Phosphorus.—Gives rise to a variety of symptoms, often of an obscure and insidious character. At the moment of swallowing it gives a disagreeable odour and taste compared to garlie or burning sulphur, followed by heat and pain at the throat, swelling of the tongue, discomfort and pain at the stomach; after a time colic pains, diarrhoea. After twenty-four to thirty-six hours the vomiting ceases, leaving wandering pains in the limbs and small soft slow pulse. About the second or third day jaundice, headache, sleeplessness, retention of urine, occasional vomiting, and acute delirium may occur,

followed by fatal stupor. Sometimes there are creeping sensations and painful cramps of the limbs, extreme prostration and repeated faintings, dry yellow skin, and about the fifth or sixth day acute delirium followed by stupor. In other cases there are repeated discharges of blood from various organs, *e.g.*, vomiting of blood and bloody diarrhœa, which may return after three weeks or a month and continue for several months, causing extreme weakness.

Treatment.—An emetic at once, such as sulphate of copper 6 grains, and, after it has acted, oil of turpentine 40 minims every 15 minutes till given four times. Next-day 60 grains of magnesia in half a pint of linseed tea or gum water.

GROUP II.—VEGETABLE POISONS.

Convulsives.—*Strychnia and Nux Vomica.*—In a few minutes after the poison, which is intensely bitter, is swallowed, the symptoms begin with a feeling of suffocation and want of air, followed by twitchings of the muscles, cramps, and jerking movements of the head and limbs, till at length all the muscles are firmly contracted, the body resting on the head and heels, the face becomes livid and congested, the eyes prominent and staring, the pupil dilated, and the features drawn into a ghastly grin. After the fit has lasted one or two minutes there is a short remission. The patient feels the approach of the next fit and cries out. If he survives for two hours there is a fair chance of recovery.

Treatment.—An emetic followed by administration of chloroform either by inhalation or by swallowing.

Deliriants.—*Belladonna, or Deadly Nightshade ; Hyoscyamus, or Henbane ; Stramonium, or Thorn-*

apple ; Solanum, or Garden Nightshade ; Camphor ; Water Hemlock ; Darnel Grass and Poisonous Fungi.—All cause delirium with illusions of the senses and extreme dilatation of the pupil, which is bright, sparkling, and prominent.

The symptoms of belladonna-poisoning are dryness of the lips, mouth, and throat, difficulty or inability of swallowing, impairment or loss of voice, dilated pupil, eyes prominent and sparkling, vision indistinct or lost, face flushed and swollen, thirst, numbness of the limbs, giddiness, staggering gait, great mental excitement ending in delirium, either gay with pleasant illusions, uncontrollable laughter, and incessant talking, or furious. The general state of the patient may resemble somnambulism, intoxication, and hydrophobia. In fatal cases stupor begins, ending in death.

Treatment.—After prompt use of an emetic such as mustard and water, give animal charcoal diffused in water, and after a time a full dose of castor oil. The treatment of all the other poisons of this class is by prompt administration of an emetic, mustard to be preferred for all except fungi, where salt is best, and followed by a tablespoonful of castor oil.

Depressants.—*Hemlock, Tobacco, Lobelia.*—Hemlock causes gradual paralysis, beginning at the extremities, and finally convulsions. Tobacco and lobelia cause vomiting, giddiness, trembling, extreme depression, and convulsions.

Treatment of all of them consists in an emetic of mustard, followed by a cup of strong hot coffee and a glass of brandy, succeeded by a dose of castor oil.

Aconite (Monkshood), Blue Rocket.—The symptoms are numbness, tingling, and burning heat in the mouth, followed by sickness, vomiting, giddiness, blindness, singing in the ears, speechlessness, great muscular feebleness, difficult breathing, and a sense of sinking.

Treatment is the same as the preceding.

Inebriants.—*Alcohol, Ether, Chloroform, Chloral.*—When swallowed in excess, these poisons produce the appearance known as dead drunkenness. After a time the patient becomes speechless, motionless, and insensible, the pupil does not respond to light, and the breathing is slow and snoring.

Treatment is the same as for opium-poisoning, with the addition of artificial respiration by Silvester's process (see DROWNING) when required.

Carbolic Acid when swallowed causes a burning sweetish sensation in the mouth and throat, rapidly followed by a feeling of giddiness and intoxication, which passes into a state of stupor, with great prostration, snoring breathing, and lowering of temperature with contraction of the pupil.

Treatment.—After an emetic, olive oil and lime water, or solution of permanganate of potash.

Irritants.—*a. Purgatives.*—*Aloes, colocynth, gamboge, jalap, scammony, elaterium, croton oil, hellbore, colchicum.* The symptoms are vomiting and purging, pain in the bowels, cramps, straining and difficulty in making water.

Treatment.—Large draughts of barley water, linseed tea, etc., 20 drops of laudanum in a glass of brandy.

b. Laburnum, yew, savin, arum (lords and ladies, cuckoo pint), *ranunculus* (buttercup, crowfoot), *bryony* (wild vine), *stavesacre.*

Symptoms are severe pain in the belly, vomiting, cramps, exhaustion, sometimes drowsiness, rigidity of the limbs, convulsions.

Treatment.—An emetic (mustard and warm water), if vomiting has not occurred, followed by a dose of castor oil.

c. Ergot of rye, mouldy bread, diseased and decaying animal matters.

Symptoms, diarrhoea, pain in the bowels, flatu-

lence, headache, giddiness, drowsiness, convulsions.

Treatment.—An emetic at once, followed by an aperient, such as a dose of castor oil.

Narcotics.—*Opium and its Preparations.*—More than a half of the whole number of cases of poisoning are due to opiates. It is especially frequent with infants, a hundred and seventy of whom were “soothed” to death in England and Wales during four years.

The symptoms vary very greatly in different cases, but are chiefly giddiness, drowsiness, and listlessness, followed by stupor, passing gradually into a state of complete insensibility. At first the patient can be easily roused by loud noises, sudden movements, or slight blows, but it soon requires violent shaking, loud speaking into the ear, flogging the hands or feet with a towel, to rouse him, and he is kept awake with extreme difficulty, and at length he falls into a state of complete stupor, with the eyes shut, the pupils contracted to the size of a pin's point and insensible to light; the breathing slow, noisy, and snoring, the skin cold and damp, and the hands and feet livid. The symptoms usually come on in about half an hour, but there are often very great variations, and many people from peculiarity of constitution resist enormous doses, while others are strongly affected by small doses. The treatment is first to empty the stomach by a tablespoonful of mustard mixed with tepid water. Dash cold water over the patient's head and face till he is somewhat roused from the stupor. On no account let him sleep for six hours at least, but keep him walking up and down, shake him, shout his name in his ear. If not aroused, slap his hands and feet; inject alternately hot and cold water into his ear; apply mustard plasters to the calves of his legs. When he begins to recover give him a cup

of strong coffee. In the excited stage which follows poisoning, let him be wrapped in a wet sheet wrung out and covered with dry blankets.

GROUP III.—ANIMAL POISONS.

Cantharides (Spanish Fly).—Soon after swallowing there is a burning sensation in the mouth and throat, followed by the same feeling at the stomach accompanied with pain in swallowing, great thirst, copious discharge of blood in the urine, straining, pain in the loins, laborious breathing, sometimes headache, delirium and convulsions.

Treatment.—Free vomiting, a dose of castor oil along with twice as much olive oil. When there is bloody urine a dose of landanum.

Poisonous Fish.—Some fish are always poisonous, some are occasionally poisonous, and some are poisonous only to certain people.

The common mussel, when grown on copper-bottomed ships or near the outflow of mines or factories, often becomes poisonous from the amount of copper it contains. The symptoms of poisoning by fish usually appear one or two hours after eating, and are swelling and itching of the eyelids, watering of the eyes, difficulty of breathing, great weakness, an eruption on the skin like nettle-rash, and, in fatal cases, delirium, convulsions, and stupor.

Treatment.—An emetic, followed by a purgative and copious draughts of milk, tea, or any fluid.

Stings and Bites.—For the most common stings, those of bees and wasps, after extracting the sting and pressing a watch-key over the spot to press out the venom, rub over the spot some moist bicarbonate of soda.

For stings of other venomous insects, tincture of iodine is a good application.

The pain of nettle stings may be relieved by the

juice of bruised dock leaves, or by bicarbonate of soda in water.

For serpent bites in many cases treatment is of no avail. A ligature should be tied round the limb nearer the heart to prevent the poison flowing on in the blood, and the wound should at once be sucked. Serpent poison can be swallowed with impunity provided there be no scratch or crack in the lip or mucous membrane. If the bitten person has the resolution to do it *at once*, cutting out the bitten part is the best treatment. Injections of ammonia and strychnine have been said to have saved life, but I have little faith in them at present—although they might be always tried. For some serpent bites large doses of alcohol are the best remedy, so much so that Americans have a proverb that a rattlesnake is wasting his time in biting a drunken man.

CHAPTER V.

MATERIA MEDICA.

THE doses of drugs must be proportionate to the age, sex, habits, and constitution of the patient. "The skill of the physician is shown in the administration of the proper remedy, in the proper quantity, at the proper time. A druggist's apprentice can tell what agents will purge, vomit, or sweat." (Tanner.) When a patient requires a considerably larger dose than is usual, or when a much smaller dose than the average causes a considerable effect, the difference is due to difference of constitution, but when it requires an exceedingly large dose to produce any effect, or a very small dose produces violent effects, the effect is said to be due to personal peculiarity or idiosyncrasy. Females on the average require less doses than males, the proportions being about nine to ten. Various diseases give a power of resisting the action of some drugs, which must be taken in larger doses in consequence. When the symptoms yield, or the effects of the drug are beginning to be seen, the dose should be diminished or stopped.

Children bear almost as large doses of mercury as adults, and therefore its doses should not be diminished below $\frac{1}{2}$ for children over 4, and $\frac{1}{3}$ for those under 4. They are, however, much more susceptible in proportion to opium, which therefore should not be given to young children if it can be avoided, and when it is given it should only be to the extent of one third or at most one half of the scale doses.

The doses may be increased or diminished *slightly*, to get rid of half-grains. Regard must also be had to the child, some requiring more than others; but the scale doses should be adhered to at first till the effect of the drug is known.

Table of Comparative Doses.

Age.						Grains or drops.	Fluid ounce.
Suppose the dose for an adult be						60	1 ounce.
Under 3 months will require only						$\frac{1}{2}$	24 minm.
"	1 year	"	"	"	"	$\frac{1}{2}$	40 "
"	2 "	"	"	"	"	$7\frac{1}{2}$	1 dram.
"	3 "	"	"	"	"	10	$1\frac{1}{2}$ "
"	4 "	"	"	"	"	15	2 "
"	7 "	"	"	"	"	20	3 "
"	14 "	"	"	"	"	30	4 "
"	20 "	"	"	"	"	40	
From 20 to 65 the full dose, above							
65 gradually diminished.							

Weights and Measures of the British Pharmacopœia.

Sign.	Weights.
gr.	1 grain.
$\frac{3}{4}$	1 ounce = 437 $\frac{1}{2}$ grains.
lb	1 pound = 16 ounces = 7,000 grains.

Sign.	Measures.
m	1 minim.
$\frac{3}{4}$	1 fluid drachm = 60 minims.
$\frac{3}{4}$	1 ounce = 8 fluid drachms = 480 minims.
O	1 pint = 20 ounces = 160 drachms.
C	1 gallon = 8 pints = 160 ounces.

In prescriptions, the letters "ss" after any sign mean one-half additional of that measure, and the

numbers are in Roman numerals ; thus, v vfs. or v vss. means $5\frac{1}{2}$ drachms.

Relation of Measures to Weights.

Distilled water at 60° F.	{	1 minim weighs	0.91 grain.
		1 fluid draehm	54.68 grains.
		1 „ oz. or 480 m.	= 437.5 „
		1 pint = $1\frac{1}{4}$ lb or	8,750 „
		1 gallon = 10 lb or	70,000 „

A fluid drachm is about an average teaspoonful ; a fluid ounce about two tablespoonsful ; a minim on an average is about a third larger than a drop ; but drops vary very much in size, according to the liquid, the shape and thickness of the lip of the bottle, and various minor conditions. In this work, where drops are mentioned, minims are to be understood, the same number of drops being under the full dose, but if a measure is not at hand the dose is not to be increased by adding more drops.

Many people find a difficulty in swallowing pills, but if the pill is put back to the root of the tongue it is swallowed involuntarily. With children and nervous persons, making a strong effort to swallow defeats its own object ; they should take the pills into the mouth, and, being told to pay no more attention to them but take several full mouthfuls of liquid, the whole will be swallowed together.

Time of Administration.

Alkaline medicines as a rule should be taken about an hour before a meal, as, by neutralising the gastric juice, they hinder digestion, and are themselves less effective.

Acid medicines should be taken half an hour after a meal.

Arsenic, phosphorus, and iron should be taken just after a meal, while cod-liver oil should be taken half an hour to an hour after dinner.

SECTION I.

EXTERNAL REMEDIES AND APPLI-
ANCES.

ANTISEPTICS.

Are substances or conditions which destroy germs or prevent their growth ; of these the most universal, cheapest, and best is Heat, few germs resisting a heat of 212° Fahr., or boiling heat, for two hours, and practically none resisting 250° Fahr. for two hours. An oven, equally heated throughout so as not to burn the articles contained, is the best means of applying it. The articles to be baked should be in a wooden box and not in contact with the metal.

Cold does not destroy germs, but it thoroughly arrests their growth, an example of which is seen in the flesh of the extinct mammoth in Siberia, which is still fresh enough to be eaten by the bears and other animals.

For inaccessible places, such as the tops of rooms, antiseptic vapours should be used, both strong and long-continued ; like heat in cooking, if too weak or too short a time, the desired effect is not produced. If the vapour can be breathed it may as a rule be taken to be useless, though there are exceptions ; generally, anything fitted to kill germs will also kill human beings, the advantage in tenacity of life being greatly on the side of the germs.

GROUP I.

Vapours or Gases.

Air.—Free exposure to the air, the oxygen contained in which is nature's disinfectant, is sufficient to kill many germs.

The air must penetrate to the centre of the articles exposed, or it will have no effect. Most dis-

infectants act by setting free oxygen, which slowly burns the things exposed to it, an example of which is seen in rusting iron. With disinfectants the action is stopped before the substance of the material is burnt, in the same way that the projecting fibres are burnt off a cotton thread by passing it rapidly through a gas flame, leaving the thread uninjured.

The oxygen of disinfectants is either given off directly as by permanganate of potash, or indirectly by absorbing hydrogen from the moisture of the air, and leaving oxygen free, as by chlorine.

To disinfect rooms, etc., all openings should be stopped, and crevices pasted up. The vapour should be so strong that it cannot be breathed even for one breath, and it should remain in the room for twenty-four hours. A weaker vapour, repeated every third day, four times in all, may be as effectual, or even more so, than one day of strong vapour.

Sulphurous Acid Gas.—Produced by burning sulphur. One pound and a half is a proper quantity for a medium-sized room (for a room of 1,000 cubic feet giving about $\frac{3}{4}$ per cent. strength of mixed gas). It may be burnt in an iron lid over a bucket of water, or in a shallow earthenware dish which will not crack with the heat and endanger setting the house on fire. Bright metal ornaments should first be removed from the room, as sulphur tarnishes them, and they afford no resting-place for germs. Books may be removed and stoved; part of the sulphurous acid gas combining with the moisture in the air to form sulphuric acid, and condensing on the books, is apt to corrode the bindings.

Chlorine Gas is preferred by many, but though effective it has no distinct advantage over sulphurous acid gas. It may be procured in sufficient quantity for a medium-sized room by mixing 2 ounces each of common salt and binocide of manganese in an earthen vessel, and pouring 4 ounces of strong

sulphuric acid which has previously been gradually mixed with 4 ounces of water over it. The water should be added in small quantities to the acid, as sudden mixture produces very strong heat. Another way to produce it is to pour 4 ounces of strong sulphuric acid over a pound of common bleaching powder (chloride of lime). Metal articles and books should be removed from the room as with sulphurous acid, the corrosive action of chlorine being but too well known to all who have their washing done at public laundries.

The vapours of iodine, bromine, and nitrous acid have all been used, but they are not more effective, are more expensive, and, in the case of nitrous acid especially, are much more dangerous, as two or three breaths of this may produce dangerous inflammation of the air passages.

Carbolic Acid Vapour is not quite so effective as sulphurous acid gas or chlorine, but it has the advantage of not corroding the articles in the room; its action being to poison the germs, and not to corrode them to death, as the others do. The vapour is best procured by the steam spray, such as is used by the illustrious Professor Lister in dressing wounds, but as we have no tender human tissues to consider, the acid should be used undiluted, containing merely sufficient water to keep it fluid. A steam spray may be extemporised as follows:—Procure a glass Florence flask or a common tin flask and bore a hole in the cork, quarter fill the flask with clear fluid carbolic acid; the common tarry acid chokes the pipes. Insert a piece of glass tube through the hole in the cork, place the cork with the tube in it in the flask, seal down the cork round the tube and mouth of the flask with common sealing wax, tie a short piece of india-rubber tube over the projecting end of the glass tube, and into the other end of the india-rubber tube

insert and tie the cross tube of a common perfume disperser; then let the upright tube of the perfume disperser dip into a shallow dish containing half a pint of clear carbolic acid. Place the apparatus on a table some height off the floor, and under the flask place a good-sized spirit-lamp filled with spirit. When the lamp is lit, after a time steam rises in the flask, and passing through the perfume disperser, sucks up more carbolic acid out of the shallow dish, throwing it out as a cloud of spray, which continues till the fluid is exhausted or the lamp goes out.

GROUP II.

Fluids or Solutions.

For all things which can be steeped or washed fluids are the most powerful and effective means of disinfection.

Carbolic Acid is the most powerful and effective of all disinfectants which do not destroy the article to be disinfected. It may be used for scrubbing floors, steeping infected clothing, and in vessels to receive the excretions. A pint of the coarse commercial acid to 2 gallons of water would be a proper proportion for such purposes.

The two chief objections to carbolic acid are that the smell is offensive to many persons, and it is highly poisonous, several fatal accidents having occurred from drinking the coarse acid in mistake for porter. Carbolic acid must not be mixed with other disinfectants; thus carbolic acid and permanganate of potash mutually destroy each other, and their disinfecting power is lost.

Permanganate of Potash is an excellent disinfectant and has several advantages. It is not poisonous, and can be used for washing dishes without a subsequent washing in water when the water is suspected; it has no odour, and hence can be used

in the sick room, but it has the disadvantage of discolouring clothing when in sufficient strength. A solution of 4 grains of the salt to the ounce of pure water is sold as Condyl's Fluid, and is also the strength of the solution of the Pharmacopœia. The colour of the solution is a deep pink, and the strength can be very accurately judged by the shade of colour. Half an ounce of the salt to a gallon of pure rain water makes a strong fluid for scrubbing floors, etc. A small amount may be added to offensive water, such as on board ships, with the result of removing smell and making it palatable; the amount added should be very small, and is to be judged by the colour (a faint pink should just be seen, and no more); after a little time the colour will probably disappear, the fluid being all used up, when a small amount may be again added if the water is still offensive. In like manner meat beginning to get bad may be soaked in a dilute solution of a faint pink colour before boiling, and afterwards boiled with two or three pieces of charcoal the size of a hen's egg.

Chloride of Aluminium is a powerful deodoriser and disinfectant which is not poisonous, has no smell, does not stain, and is comparatively cheap. It may be used to wash infested clothing, to scour floors, disinfect drains, etc. It is often sold under the name of "ehloralum," and may be used as a solution of half-a-pound to a gallon of water.

Bleaching Powder, which is a mixed ehloride of lime, is useful for scrubbing purposes, and is largely used in the arts as a bleaching agent for yarns, paper, etc. A solution of half-a-pound to a gallon of water may be used for scrubbing floors, disinfecting water-closets, drains, etc.

Chloride of Zinc.—One ounce to a gallon of water makes a poisonous disinfecting fluid for scrubbing purposes.

Sulphate of Zinc or Copperas.—Three pounds to a gallon of water makes a disinfecting solution for scrubbing, etc.

Lime Wash of freshly slacked lime is a good and cheap disinfectant and cleanser for walls of out-houses, etc.

Many other substances are also disinfectants, but the above list contains more than enough for all purposes. In fact, heat, sulphurous acid gas, carbonic acid, permanganate of potash, chloride of aluminium, and lime wash are practically sufficient for all the various purposes which require disinfectants.

GROUP III.

Solids.

Are chiefly for outdoor use, disinfecting cesspools, manure heaps, etc.

Charcoal.—A layer of freshly-burnt charcoal is an effective deodorant, and to a considerable extent antiseptic, the charcoal condensing a large amount of oxygen in its pores. A layer, two inches thick, of powdered charcoal may be laid over manure heaps, soaked earthen floors, and openings from which foul gases escape.

Lime.—A layer, three inches thick, of freshly-burnt lime is also an effective antiseptic for outdoor use, especially for stagnant fluids and pools of water, in which it destroys both the insects and slime or weeds; it is more efficient than charcoal, but corrodes anything touching it, and loses its action on the surface sooner.

Salt.—A layer of salt, half-an-inch thick, is sometimes of use by soaking into the ground, and remains effective for a long time if preserved from rain. Salt is the most ancient of all antiseptics, having been used to preserve meat from the earliest ages.

There are many other solids which can be used as disinfectants, but most of those in use, such as car-

bolic acid powder, bleaching powder, etc., are better used as solutions in water.

Baths.

Temperature of Baths.

The cold bath	50° F. to	70° F.	Vapour baths.
„ tepid „	85° F. „	92° F.	90° to 100°
„ warm „	92° F. „	98° F.	100° „ 105°
„ hot „	98° F. „	109° F.	115° „ 130°

Cold Bathing is invigorating and tonic to those of tolerably strong constitution, but may be dangerous, or even fatal, to weakly people with small power of reaction. If the person comes out of the water with blue or white shrunken fingers, pale face, and instead of a pleasant glow feels languid, chilly, and drowsy, the bath must not be repeated, but tepid water used. Sea water is preferable to fresh water, and very strong persons may bathe in even icy water without any evil result, one of my friends often bathing in the sea while snow is falling; the great point in cold bathing being to have the skin thoroughly and quickly dried (see INTRODUCTION).

The Shower Bath is a most excellent tonic, but gives a considerable shock, and should have the chill taken off the water (75° F.) for children and weakly persons.

The Wet Sheet Bath is a combination of a cold and warm bath, the cold sheet at first giving a shock and causing reaction, and after the sheet gets warm it acts vigorously as a warm bath, encouraging perspiration, soothing, and causing a tendency to sleep. It is made by wringing a sheet out of cold water, 65° F., wrapping it round the patient and then covering him tightly with a number of dry blankets. Though useful, it does not seem to be very pleasant. *The Douche* consists in pouring cold

water from a height of three feet over the head, and is used in poisoning by prussic acid, and also in intense fevers, the patient being seated in a warm bath. It is a powerful and dangerous depressant, and to be used with great caution. The time of all cold baths should be regulated by the result, and stopped at once whenever a feeling of chilliness comes on. A vigorous person in cold water does not feel cold and chilly; the water, of course, feels cold to the skin, and gives a slight prickly sensation, but the individual feels comfortable and braced up.

The Warm Bath, or Hot Bath, is of the most general use in disease, acting as a cooling agent in fevers, almost, if not quite, as powerfully as a cold bath, and procuring sleep, soothing general or local irritation, and for weak and irritable states which could not stand the cold bath. It is also used in convulsions, and irritation of the kidneys. *Vapour Baths* are chiefly of use for gout, rheumatism, skin diseases, and commencing colds. A vapour bath may be extemporised by tying a tube over the spout of a kettle and fastening the other end in a small basket tied under a cane-bottomed chair; the patient sits on the chair and is covered, chair and all, with a couple of blankets pinned round the throat and down the front to the ground. *Foot-baths* are perhaps the most common and useful of hot baths; when a strong effect is wanted 4 ounces of mustard may be added.

Baths should not be taken for two hours after a full meal; cold baths withdrawing the nervous energy, and hot baths withdrawing the blood from the stomach (see INDIGESTION, p. 289).

Blisters.—*Cantharides, or Fly Blister*, is used to check internal inflammations, cause increased action and absorption of disease products, and to relieve pain. A rising blister usually requires to be left on ten hours, but the time varies according to

the delicacy of the skin; in children often not five hours. When the skin begins to rise the blister should be taken off, the blebs half emptied by piercing them with a needle, and the part dressed with a piece of linen smeared with lard. Fly blisters must not be used when there is any affection of the kidneys.

Mustard Poultices or Blisters should affect the skin in ten to twenty minutes, and the part should be dressed with linen smeared with lard. They are made by mixing ground mustard with warm vinegar, and laying it thinly, about the thickness of a shilling, over a linen cloth, which, for ease in removing, should be covered with a piece of thin muslin.

A blistering fluid to be painted on with a small brush is now much used instead of the old blister, and leaves of mustard instead of mustard poultices, both of which are quickly applied, cleanly, and as effectual. *Acetic Acid* is sometimes used as a blister, acting very quickly and not producing much inflammation. It is applied by a piece of blotting-paper dipped in it being laid on the skin.

Turpentine does not cause blistering unless the vapour is confined, but is very useful when an effect short of blistering is required.

Fly blister and turpentine must not be used when there is any disease of the kidneys.

Blood-letting (*Venesection*).—A vein at the bend of the elbow is usually chosen. A piece of broad tape is tied round the arm with moderate firmness a little above the bend of the elbow, which causes fulness of the veins below it, one of which will be found dividing over the bend into two branches, one going to the outer and one to the inner side. The one chosen should be that going to the outer or thumb side (median cephalic), as the other passes over an artery, which might be

wounded with dangerous results. The operator places his thumb on the vein a little below where he intends to open it, pushes the lancet obliquely into the vein, and makes it cut directly out. When sufficient blood has been taken, the tape is removed, a pad of lint placed over the wound, and a bandage applied round the elbow in a figure ∞ shape.

Cupping.—Is a means of applying suction and drawing blood to one part of the skin, and is called wet cupping when blood is drawn, dry cupping when no blood is drawn. The part to be operated on, most commonly the back, neck, or loins, is made bare, sponged with hot water to quicken the circulation, and dried with a warm towel; the patient is put into a comfortable position, and a piece of blotting-paper dipped in spirits of wine is put into the bottom of the cupping-glass (any round glass, such as a small tumbler, will do). The glass is then brought close to the part—the lower edge may be touching—the spirit set on fire, and it is pressed down over the selected place. The effect is to form a vacuum which exercises a powerful sucking action, and draws the blood to the part. If blood is to be taken, an instrument called a scarificator, which consists of several lancets set on an axle and discharged by a spring, is used, and the glass applied as before. After removing the glass the lance cuts are closed by a piece of sticking-plaster.

Foods.—*Liebig's Food for Infants and Invalids.*
—Take half-an-ounce of wheat flour (seconds is best), half-an-ounce of malt flour (a heaped tablespoonful of flour weighs nearly half-an-ounce), 7 grains of bicarbonate of potash, and an ounce of water; mix them well together, add 5 ounces of milk, and put the whole over a gentle fire. When it begins to thicken remove it from the fire and stir for five minutes; heat and stir again, and then

allow it to boil; pass through a sieve to separate the bran, and it is ready for use, and keeps good for twenty-four hours. It is slightly laxative.

Mellin's Food for infants and invalids is an exceedingly good food, easily digested, and can be given in very irritable and weak states of the stomach.

Benger makes a pancreatised food which is readily digested by the youngest infants, and very useful for weak invalids. The digestive process goes on when the food is being prepared. When mixed with warm milk the pancreatic ferment renders the starchy material soluble, and reduces the casein to the same condition in which it exists in human milk.

There is another excellent food manufactured by the Frame Food Company, Battersea, called Frame food diet. I have always found it readily digested by weakly infants, and of great benefit to invalid children. Also for delicate children a preparation called Frame food Jelly is an excellent substitute for malt extract, and can be eaten on bread and butter, like jam.

Beef Tea. See p. 31.

Bread Jelly.—Take some of the soft part of a loaf, break it up and cover it with boiling water; allow it to soak four hours, strain off the water completely, and add fresh boiling water; place it on the fire and allow it to boil till it becomes smooth; then press out the water, and the bread, on cooling, will form a thick jelly, which is to be mixed with milk, and sweetened. It forms a good food for infants who are weaned, and children suffering from fevers.

Sack Whey.—Add a wineglassful of sherry to half-a-pint of boiling milk, strain off the curd, and sweeten the whey for use.

Soothing and Nourishing Drink.—Boil a teaspoonful of isinglass in half-a-pint of milk with half-a-

dozen bruised almonds, and sweeten to taste. This makes a soothing drink for inflammation of the throat and tonsils.

Caustics are substances which destroy the parts they come in contact with.

Acetic Acid (strong), used to burn corns and warts.

Nitric Acid (strong), used to check unhealthy action; the acid is applied with a glass rod, and when it has burnt enough the action is checked by a stream of cold water poured over the part or by sprinkling bicarbonate of soda over it.

Caustic Potash.—A strong caustic used for unhealthy sores, growths, etc.; the action is stopped by vinegar.

Copper Sulphate (blue stone).—Used to stimulate unhealthy, flabby sores, by touching them lightly with it.

Silver Nitrate (lunar caustic).—Used in the solid form for unhealthy sores, stopping small bleedings, destroying warts, etc. The touched part blackens after a time by exposure to daylight; the action is stopped by salt and water, and the stain partly removed by subsequent application of ammonia.

Zinc Chloride is one of the most powerful and penetrating caustics.

Gargles are used to wash the mouth and throat, but are not swallowed.

Alum.—Alum a quarter of an ounce, tincture of capsicum (Cayenne pepper) 1 drachm, water 8 ounces. Mix all together and use as a gargle frequently in relaxed sore throat, chronic inflammation, and hoarseness.

Borax.—Borax a quarter of an ounce, glycerine 1 ounce, and water 7 ounces; all to be well shaken together. Used for thrush and ulcers, or fissures in the mouth.

Hydrochloric Acid.—Dilute hydrochloric acid 3

drachms, honey 1 ounce, acid infusion of roses 7 ounces. Mix. Used after quinsy has begun to subside.

Permanganate of Potash.—Permanganate of potash 8 grains, water 8 ounces. Used when there is an offensive slime or discharge from the mouth.

Tannin.—Tannic acid 20 grains, camphor water 4 ounces. Used for chronic inflammation and swelling of the tonsils. Tannic acid lozenges may be used instead when the patient has to attend to his business and cannot take a gargle with him. Plain cold water or salt-and-water gargles may be sufficient for slight degrees of relaxed sore throat.

Leeches.—Two kinds are used in medicine, the brown or spotted leech (which is considered the best) and the green leech, which is usually somewhat larger. The body is two to three inches long, tapering to both ends, the smaller end having the mouth. Each leech on an average takes 1 drachm of blood, though half an ounce or more may be taken by applying hot fomentations to the bite. Leeches should always be applied over a bone, as behind the ear or over the breast bone, so as to give control over any subsequent bleeding. The part should first be washed with milk and the leech applied through a leech glass or by holding the larger end in a napkin or covering it with a wine-glass so that it cannot crawl about and fasten on the wrong place. If it is desired to detach the leech, do not pull it off forcibly, but sprinkle a few grains of salt on its head; it should then be put into salt water, a teaspoonful to a wine glass of water, when it will disgorge the blood, after which it may be kept for future use in fresh water changed twice a day for the first three days; afterwards every four days will do. The bleeding from the bites may be stopped by the pressure of a small pad of lint held on by the finger for two minutes

and then retained by a strip of plaster, or a little collodion painted over it; if the bleeding proves obstinate, a stick of lunar caustic should be firmly pressed into the bite; in extreme cases a needle may be passed through the wound from side to side, and some thread passed round it in the form of the figure ∞ . The number of leeches applied varies with the age of the patient; one leech for every two years of age, but not to exceed six, may be taken as a general rule.

Liniments are oily or soapy substances rubbed or painted on the part.

Aconite.—Aconite root (monksblood) 20 ounces, camphor 1 ounce, spirit 20 ounces. It causes numbness and cessation of local pain.

Ammonia, strong.—Ammonia 1 ounce, olive oil 3 ounces. A counter-irritant, used over painful joints, etc.

Belladonna (deadly nightshade).—Equal parts of the root and spirit, with a little camphor; a soothing liniment where there is much pain or spasm.

Iodine.—Iodine $1\frac{1}{4}$ ounce, iodide of potassium $\frac{1}{2}$ ounce, camphor $\frac{1}{4}$ ounce, rectified spirits of wine 10 ounces. Used to paint over enlarged glands and swellings to make them disperse; and over the chest as a mild counter-irritant. Tincture of iodine is still milder, having only one-quarter of the strength of the liniment.

Soap (opodeldoc).—Hard soap $2\frac{1}{2}$ ounces, camphor $1\frac{1}{4}$ ounce, oil of rosemary 3 drachms, spirits of wine 18 ounces, distilled water 2 ounces. It is a good application when friction is useful.

Lotions are watery solutions usually applied by wetting a rag or bandage and laying it on the part.

Alum.—Two to 6 grains to the ounce. Used principally for the eye. Astringent.

Ammonia Acetate (solution) 1 ounce, spirits of wine 2 ounces, water 5 ounces; is good cold lotion.

Ammonium Chloride (*sal ammoniac*) 1 ounce, vinegar 4 ounces, water 15 ounces, makes a pint of cold lotion for diseases of the brain.

Arnica.—One drachm of the tincture to 1 ounce of water makes a good cooling lotion for sprains, bruises, and the like.

Atropia (*sulphate*) is the active principle of belladonna, or deadly nightshade. One to 4 grains to 1 ounce of distilled water; 1 to 2 drops to be let fall between the eyelids. Anodyne.

Belladonna.—Three grains of the extract to 1 ounce of distilled water makes a soothing lotion, used over the eye in children.

Glycerine.—Equal parts of glycerine and soft water make a good lotion for several skin diseases.

Lead Acetate (solution).—Two drachms of the solution and 2 drachms of spirits of wine, with 19½ ounces of water, form the dilute solution, or Goulard water; a soothing and astringent lotion for inflammations. It should not be used on a broken skin nor longer than a fortnight.

Silver (*nitrate*).—One to 3 grains to 1 ounce of distilled water forms a soothing lotion for inflamed and itching skin and an astringent in some diseases of the eye.

Sulphurous Acid (the gas produced by burning sulphur dissolved in water).—With an equal amount of glycerine it forms a good lotion for parasitic skin diseases.

Zinc Sulphate 20 grains, glycerine 1 ounce, water 3 ounces; an astringent, soothing lotion for some skin diseases.

Ointments.—*Aconitina*.—Paralyses the nerve-ends in the skin, soothing pain, but sometimes producing intense irritation of the skin.

Chrysophanic Acid.—The acid of Goa powder—5 to 80 grains to an ounce of lard. It has been very successful in lepra and parasitic skin diseases. If

used too strong it is apt to cause distressing irritation of the skin, which from dusky red becomes bright red and swollen, and is accompanied by intense tingling and smarting. The acid is also a dye, staining the skin, hair, and nails a deep purple brown. The dye does not become fixed until it meets a mordant (potash or soda), so that stains may be removed from the hair and underclothing, if they have not been washed (soap contains soda) by benzol or warm olive oil. In using the ointment the skin is first wiped with a rag dipped in benzol, and then washed with soap and water to remove the scales before applying the ointment.

Galls.—Powdered galls 80 grains, benzoated lard 1 ounce. Used for bleeding piles.

Galls and Opium.—Ointment of galls 1 ounce, powdered opium 32 grains. Used for painful piles; the size of a pea to be used at one time.

Iodine.—Iodine and iodide of potassium of each 32 grains, proof spirit 1 drachm, lard 2 ounces. Used over chronic swellings, especially of glands.

Iodide of Sulphur 30 grains, lard 1 ounce. Used in some skin affections.

Nitrate of Mercury (Citrine or Golden Ointment), diluted with 7 parts for lard, is used for chronic inflammation of the eyelids.

Red Oxide of Mercury 10 to 20 grains to the ounce of lard is an excellent ointment for chronic eczema, especially eczema capitis in children after removal of the scabs, or it can be used for ulcers as a mild stimulant.

Oxide of Zinc 80 grains, benzoated lard 1 ounce. Astringent, soothing, drying.

Spermaceti Ointment.—Used to protect the skin from acrid discharges and to cover slight wounds. With 60 grains of balsam of Peru added to the ounce, and flavoured with attar of roses, it is used as a lip salve.

Sulphur.—Benzoated lard 4 ounces, sulphur 1 ounce. Used in skin diseases.

Tar Ointment.—Tar 5 ounces, yellow wax 2 ounces. Used chiefly in scaly skin diseases.

Other External Applications.—*Caoutchouc Solution*.—Five grains of indiarubber tissue dissolved in 1 drachm of chloroform may be used to paint over threatened bedsores.

Carbolic Oil.—Olive oil with 1 part in 40 or in 100 of carbolic acid added; a tablespoonful of acid to an imperial pint of oil makes 1 to 40. Used to dress wounds, prevent infection from the scales of skin in some infectious fevers.

Collodion is a solution of gun-cotton in ether and one-third its bulk of spirits of wine. *Flexible Collodion* consists of Canada balsam 20 grains, castor oil 10 minims, collodion 1 ounce. Painted over threatened bedsores, it makes an artificial skin, which does not crack by moving. Two parts of glycerine to 100 parts of collodion makes another good varnish; and so also does two parts of castor oil to one of collodion.

Linseed Oil and Lime Water (Carron oil).—Equal parts of linseed oil and lime water, well shaken up to form an emulsion, make a bland dressing for severe burns and large skin wounds, as after severe erysipelas.

Poultices.—Poultices are a means of applying uniform heat and moisture to the skin. Almost any soft substance which will retain heat and moisture may be used to make a poultice, which should be quite smooth and free from lumps or hardness, and covered with oiled silk or waterproof when it is applied.

Bran.—Bran, which is the outer husk of wheat, retains heat for a long time, and is soft and yielding. Heat the bran in an oven, and then sprinkle it freely with boiling water and apply to the part,

covering it with a piece of oil-cloth. It acts partly as a vapour bath, and is used for most acute inflammations, particularly of the chest.

Bread.—Scald out a basin with boiling water, then put in a sufficient quantity of bread-crumbs broken up, and cover it with fresh boiling water; cover the basin with a plate and let it stand two minutes; pour off the water and turn the bread into a piece of folded linen; grease the skin with oil or lard to prevent the poultice sticking; apply the poultice and keep it close with a bandage.

Charcoal is used for foetid sores. It is made by adding an equal amount each of linseed meal and powdered charcoal to a bread poultice.

Linseed Meal.—Scald out a basin, then pour some boiling water into it, and add the meal little by little, stirring the while with a stick, and adding more boiling water along with the meal. It should form a smooth stiff paste, and be spread an inch thick upon the linen.

Mustard Poultice (see BLISTERS).

Patent Poultices, somewhat like mustard leaves, are a quick and cleanly application to the chest in bronchitis.

Subcutaneous Injection.—Is a method of administering medicine introduced by Dr. Alexander Wood, where very rapid action of the drug is desired, and in cases where it would be impossible or inconvenient to give it in the usual way, or where a local action is desired speedily. A solution of the drug of a proper strength is drawn into a small graduated glass syringe, to the point of which a hollow needle is screwed on. The needle is plunged beneath the skin, a fold of which is previously pinched up, usually in the middle of the outer side of the upper arm, and the piston of the syringe is then slowly pressed down, injecting the solution beneath the skin, where it is speedily absorbed.

The piston of the syringe should be damped before being used by drawing it up and down several times in a cup of warm water. The operation does not cause much pain.

Tapping.—Is the operation of drawing fluid from a closed cavity, usually the belly or the chest, and is done by means of a needle set in a handle and enclosed in a metal sheath (trocar and canula). The best form is that having a side pipe, to which a piece of indiarubber tube is tied, the other end when in use dipping into a pail of water. Before using, the needle and sheath should be smeared with carbolic oil, 1 to 40, and the indiarubber soaked in carbolic acid and water, 1 to 40. In tapping the chest (*paracentesis thoracis*) the needle is plunged in a little below midway between the seventh and eighth ribs, sloping slightly upwards and a little to the back of midway between the spine and the chest. In tapping the belly (*paracentesis abdominis*) the bladder should first be emptied, and the patient put sitting in a chair. A broad flannel bandage should be placed round the belly, with the ends split into three, and crossed behind with the pieces interlocking; each end should then be held by an assistant, who keeps a constant steady pull as the fluid escapes to keep moderate pressure on the belly; otherwise dangerous or even fatal fainting might occur. A hole should be cut in the bandage where the trocar is to be introduced, the spot being in the middle line of the belly, midway between the navel and bone above the organs of generation (pubes). The spot should be tapped with the finger, lest there should be a piece of distended bowel at the place, which would give a hollow sound like a drum—fluid giving a dull sound. The instrument should be inserted by one firm push, and after it is withdrawn the wound should be closed by a piece of sticking plaster which has been dipped

in carbolic acid and water, 1 to 40, and the abdomen firmly bandaged, with the flannel binder, or a sheet does very well doubled in four.

SECTION II.

INTERNAL REMEDIES.

ARRANGED ALPHABETICALLY, WITH THEIR
CHIEF EFFECTS, PREPARATIONS, DOSES, AND
NECESSARY PRECAUTIONS.

Acids.—The doses of the liquid acids are of the dilute acids of the Pharmacopœia, and should be taken in a considerable quantity of water. All strong acids and acid medicines, such as tincture of iron, if taken for any length of time, corrode the teeth, to avoid which they may be sucked up through a bent glass tube, or a quill, so that the fluid does not fall on the teeth, and the mouth should be thoroughly rinsed out after each dose, otherwise the teeth may be utterly destroyed. Acids should be taken about half an hour after a meal, except hydrocyanic acid, which should be taken half an hour to an hour before food.

Acetic, strong, is used as a blistering agent and to burn corns. Dilute or vinegar as a cooling drink and astringent. Dose, 1 drachm freely diluted.

Gallic.—Astringent to check bleeding and discharge from mucous surfaces. Dose, 2 to 10 grains.

Hydrochloric.—Cooling, astringent, tonic. Dose, dilute, 10 to 20 drops or minims.

Hydrocyanic (Prussic).—Sedative, used for irritable heart and painful indigestion; but it is dangerous from the not uncommon occurrence of a peculiarity of constitution in reference to it, in which even a small dose may be too much; hence the first dose

should not be more than half a full dose, and the bottle of acid, or of mixture containing acid, should be shaken up before pouring or dropping out each dose, otherwise the last doses may be deficient in strength, while the first ones may be dangerously strong; for similar reasons, on beginning a new bottle of medicine containing this acid, commence with half a dose. Dose of dilute acid, 2 to 4 minims or drops.

Nitric.—Astringent, tonic, cooling. Dose, dilute, 10 to 20 drops or minims.

Nitro-hydrochloric.—Tonic, astringent, cooling. Dose, dilute, 10 to 20 drops or minims.

Phosphoric.—Tonic, cooling, allays thirst in diabetes. Dose, dilute, 10 to 30 drops.

Salicylic.—For rheumatism. Dose, 10 to 30 grains.

Sulphuric.—Astringent, tonic, cooling. Dose, dilute, 10 to 20 drops or minims.

Tannic.—Checks bleeding. Astringent for relaxed sore throat. Dose, 2 to 10 grains.

Aloes.—A valuable bitter tonic, purgative, acting chiefly on the lower bowel. Abuse of it may give rise to piles. Dose, 2 to 4 grains.

Pill, 4 to 15 grains, compound decoction 1 to 2 ounces.

Alum.—A useful astringent in sore throat. Dose, 5 to 15 grains.

Ammonia (Strong solution).—A powerful stimulant, and reddens the skin. Dose, 3 to 5 drops in water.

Ammonia Acetate is used only as a solution. It is made from carbonate of ammonia and acetic acid. It is not a stimulant, but it increases the secretion of the skin and kidneys. Dose, 2 to 6 drachms freely diluted.

Aromatic Spirit of Ammonia (sal volatile).—Dose, $\frac{1}{2}$ drachm to 1 drachm. Stimulant.

Carbonate of Ammonia.—Stimulant and antacid,

expectorant, and promotes perspiration. Dose, 3 to 10 grains. In large quantities, such as 30 grains, it is emetic.

Amyl Nitrite dilates the arterics and diminishes the blood pressure. Used in angina pectoris and some forms of spasmodic asthma. Dose, 2 to 5 drops.

Anise is useful in flatulence and for sore throats. Dose of the oil, 5 drops in mixture or on sugar.

Antimonial Wine.—Expectorant, emetic, depressant. Dose, 15 to 40 minims. Antimony is sometimes dangerous from idiosyncrasy.

Compound Powder (James's Powder).—One part oxide of antimony and 2 parts phosphate of lime. Diaphoretic, expectorant, emetic. Dose, 2 to 6 grains.

Tartrate (tartar emetic).—Alterative $\frac{1}{10}$ grain, diaphoretic and expectorant $\frac{1}{2}$ grain, vascular (blood, depressant and sudorific $\frac{1}{4}$ grain, emetic 1 to 3 grains.

Wine.—Expectorant, depressant, emetic. Fifteen to 40 minims.

Antipyrin is in small soluble crystals very useful as an antipyretic, and in neuralgia. Dose, from 5 to 10 or 20 grains.

Arsenic is the next best to quinine for malarious fevers and other periodic disorders; it is also used with advantage in many skin diseases and as a nervine tonic. The dose should be given just after food, and stopped for a time when its effects begin to be felt, and again resumed when the effects pass off. These are a pricking pain at the stomach after each dose, itching and swelling of the eyelids, redness of the white of the eye, a feeling of sickness and uneasiness at the pit of the stomach, and a peculiar white silvery appearance of the tongue.

There are three officinal solutions (potash, or liquor arsenicalis, soda, and hydrochloric acid

solutions), all of them nearly of the same strength. Dose, 2 to 6 minims.

Assafoetida.—Stimulant and antispasmodic. Useful in hysteria and flatulence. Dose, 5 to 20 grains.

Bael.—An Indian fruit, useful in chronic diarrhoea and dysentery. Dose of the liquid extract, 1 to 4 drachms.

Bearberry Leaves (Uva Ursi).—Astringent. Used in affections of the urinary organs. Dose of the infusion ($\frac{1}{2}$ ounce of the leaves to 10 ounces boiling water), 1 to 2 ounces.

Belladonna.—A useful soothing agent which does not bind the bowels, narcotic, and anodyne (for overdose see POISONS). Dose of the tincture, 5 to 30 minims; of the extract, $\frac{1}{4}$ to 1 grain.

Bismuth Subnitrate.—Soothing, tonic, astringent. Used in painful affections of the stomach. Dose, 5 to 20 grains.

Blue Pill.—Mercury rubbed up with confection of roses and liquorice. A mild purgative and alterative. Useful in bilious vomiting. Dose, 4 grains.

Borax.—Soothing, alkaline, anti-septic. Dose, 10 to 60 grains.

Borax (Honey of).—Sixty-four grains of borax to 1 ounce of honey is readily taken by children, and used in thrush.

Bromide of Potassium.—Soothing in convulsive nervous affections. Dose, 5 to 20 or 30 grains.

Calomel.—A soothing purgative, but should not be often repeated. Dose, 1 to 5 grains.

Calumba Root.—A simple bitter tonic. Dose of the infusion ($\frac{1}{2}$ ounce to 10 ounces of water), 1 to 2 ounces.

Camphor.—Slightly stimulant and antispasmodic. Dose of camphor water, 1 to 2 ounces. The water is made by keeping pieces of camphor in a corked bottle full of water for two days. The

compound tincture of camphor contains opium (1 grain in 4 drachms), and is very useful to check cough in bronchitis. Dose, 20 to 60 minims.

Castor Oil.—A simple safe purgative. Dose, 1 drachm to $\frac{1}{2}$ ounce.

Catechu.—Astringent, used in diarrhœa. Dose, $\frac{1}{2}$ drachm to 2 drachms of the tincture.

Chalk.—Antacid, astringent. Dose, 10 to 40 grains.

Aromatic Chalk.—Dose, 15 to 30 grains.

Chalk Mixture.—Prepared chalk and gum acacia, of each $\frac{1}{4}$ ounce; syrup, $\frac{1}{2}$ ounce; cinnamon water, $7\frac{1}{2}$ ounces. Aromatic, antacid, astringent. Dose, 1 ounce repeatedly.

Chamomile.—An excellent bitter tonic; in large doses emetic. Dose, 1 to 4 ounces of infusion, 2 to 10 grains of extract.

Charcoal.—Used in painful acid indigestion and foetid eructations. Dose, 20 to 60 grains.

Chloral Hydrate is used to allay pain, procure sleep, and check muscular spasm. It does not cause headache and sickness like opium, and is not so dangerous for children. Dose for adults, 10 to 30 grains. It should not be used continuously for any length of time, nor where there is a weak heart.

Chloroform.—If it can be possibly avoided, chloroform should not be administered by untrained persons; but, if it must be given, let the patient fast for four hours before giving it, to lessen the chance of vomiting and avoid the mess and danger occasioned by it. A few minutes before giving the chloroform the patient should have a glass of brandy, which helps to prevent vomiting and retching. Before inhaling, the nose and mouth should be slightly oiled to prevent the irritation causing blisters. The patient must lie down on his back, with the head very slightly

raised, the dress loosened over the whole body and quite free at the throat. The chloroform should be poured, about a teaspoonful at a time, over a towel folded in the shape of a cone, and applied over the mouth and nostrils, about two inches away from the face at first. Tell the patient to breathe quietly and slowly, and not to be afraid of inhaling. The breathing must be carefully watched, and when it becomes snoring the towel must be at once removed quite away. If breathing should stop, the tongue must at once be pulled out, and artificial breathing begun (see DROWNING, p. 397); but it is as well to know that at first patients often hold in their breath over the space of two or three breathings. If vomiting occur, the head must be kept on one side, lest some of the vomited matter falling back cause choking. Next day the patient will be very sick, with headache and constipation if he has been under its influence for any length of time. Chloroform has been found remarkably safe in labours, where, however, it is not pushed so far as for operations. When properly administered it is by no means so dangerous as is commonly thought; in one hospital out of 4,000 successive cases of operation in which it was given there was only one death.

Cochineal.—A common carmine dye; soothing. Used for coughs. Dose, $\frac{1}{4}$ grain to $\frac{1}{2}$ grain.

Cod-liver Oil.—A valuable remedy in scrofula and all affections of the chest. It should be taken for three weeks at a time and then stopped for a week, as continuous use of the oil for a considerable time is apt to cause disgust and loathing which may prevent resumption of the remedy even after a considerable time. Dose, 1 to 2 teaspoonsful twice a day.

Colchicum (the root of the meadow saffron).—A useful remedy in gout and rheumatism, but re-

quires to be watched, as it often produces pain in the bowels. Sometimes large doses cause dangerous depression, vomiting, and purging. Dose of the tincture, 20 to 30 drops; of the seeds, 3 to 8 grains.

Colocynth.—A powerful purgative, acting chiefly on the small bowel, and producing watery stools. Dose of the compound pill with hyoscyamus, 5 to 10 grains.

Conium (Spotted Hemlock).—Allays muscular spasm, and relieves pain by numbing the ends of the nerves. Dose of the extract, 2 to 4 or 6 grains.

Copper (Sulphate).—Astringent in obstinate diarrhœa, but must not be long continued. Dose, $\frac{1}{4}$ grain to 1 grain; emetic, 5 to 10 grains.

Cream of Tartar (Acid Tartrate of Potash).—A useful watery purgative and diuretic, useful in diseases of the kidney because it carries off water by the bowels. Dose, $\frac{1}{2}$ drachm to $\frac{1}{2}$ ounce.

Creasote.—Antiseptic. Allays vomiting. Dose, 1 to 2 drops.

Croton Oil.—A very powerful purgative, used chiefly in apoplexy. Dose, 1 to 2 drops.

Curare.—A powerful poison used in tetanus. Dose, $\frac{1}{2}$ grain by subcutaneous injection.

Digitalis (the dried leaf of the common fox-glove).—A powerful remedy, causing the heart to beat slower and stronger, and increasing the flow of urine. Being a cumulative drug, its action must be watched, and it must never be given alone, but always along with some diuretic, such as acetate of potash, otherwise dangerous. Dose of the leaves, 1 to $1\frac{1}{2}$ grains, of the tincture, 10 to 30 drops.

Dill.—Carminative, stimulant, aromatic. Useful in flatulence. One pound of fruit distilled with

two gallons of water makes dill water. Dose, 1 to 2 ounces.

Donovan's Solution.—A solution of the iodo-arsenite of mercury. Dose, 5 to 20 minims, after food.

Dover's Powder. (See *IPECACUANHA* and *OPIMUM*.)—Dose, 3 to 12 grains.

Ergot (Spurred Rye).—Useful in internal bleedings. Dose, 10 to 20 grains.

Ether. Useful as a stimulant and antispasmodic. Dose, 10 to 30 drops.

Gall (Ox). Used in indigestion, 2 to 6 grains two hours after dinner.

Gentian.—The dried root of the yellow gentian. A simple bitter tonic. The compound infusion is made from 1 drachm of the dried root, fresh bitter orange and lemon peel of each $\frac{1}{4}$ ounce, boiling water 10 ounces. Dose, 1 to 2 ounces.

Glycerine.—Used to soften the harshness of perchloride of iron, to sweeten medicines, and is soothing and nourishing, used also in painful and bleeding piles. Dose, $\frac{1}{2}$ drachm to 2 drachms in water.

Gregory's Powder. (See *COMPOUND RHUBARB POWDER*.)—Dose, 20 to 60 grains.

Grey Powder.—Mercury rubbed up with chalk. Useful as an alterative medicine when the stools are pale and unhealthy. Dose, 3 to 8 grains, with the same amount of rhubarb powder.

Guaiaecum.—The resin of greenheart wood. Useful in rheumatism and sore throat. Dose, $\frac{1}{2}$ ounce to 2 ounces of the mixture, which is composed of resin $\frac{1}{2}$ ounce, sugar $\frac{1}{2}$ ounce, gum acacia $\frac{1}{4}$ ounce, common water 1 pint.

Gum Acacia.—Composed of 4 ounces of gum arabic and 6 ounces water; used to protect inflamed surfaces and suspend medicines. Dose, as much as wanted.

Gurjun Oil.—A stimulant oil of a large tree, used externally in leprosy, rubbed on for half an hour twice a day.

Hyoscyamus (Henbane).—Soothing and narcotic. Used to prevent purgatives causing griping. Dose of the extract, 3 to 10 grains.

Indian Hemp (Cannabis Indica).—A soothing antispasmodic and narcotic, with less unpleasant after-effects than opium. Some constitutions are much more easily affected by it than others. Dose of the extract, $\frac{1}{4}$ to 1 grain; of the tincture, 10 to 20 minims.

Iodide of Potassium.—Used to cause absorption of morbid products, and change diseased into healthy action. After continuance for some time in using it, the general effects of iodism appear, like the symptoms of a cold in the head, with a copper taste in the mouth, when the medicine must be stopped for three days and then begun again. Dose, 3 to 12 grains.

Ipecacuanha.—Causes increased perspiration and spitting in small doses, and causes vomiting in large doses. The *powder* is most useful in diarrhœa and dysentery, the *wine* for croup, and where vomiting is wanted speedily, and the compound powder (Dover's powder), which is composed of $\frac{1}{2}$ ounce each of opium and ipecacuanha with 4 ounces of sulphate of potash, for producing perspiration, relieving cold, pain, etc. Dose of the powder, $\frac{1}{2}$ grain to 2 grains as an expectorant, 15 to 30 grains as an emetic; of the wine, 10 to 30 minims as an expectorant, 3 to 6 drachms as an emetic; of the compound powder, 3 to 12 grains.

Iron.—There are upwards of thirty different preparations of this valuable tonic, but the following selection is more than enough for all purposes. All the preparations of iron act on the blood, increasing the red corpuscles.

Carbonate (saccharine) is the only alkaline preparation of iron, and has little or no constipating effect; hence it is used with irritable stomachs, where no local action is wanted. It does not keep except in pill or made up with sugar. Dose, 6 to 12 grains.

Iodide.—Used in scrofulous conditions. Dose of the pill, 3 to 8 grains; of the syrup, $\frac{1}{2}$ to 1 drachm.

Lactate.—Used in weak digestions; very slightly astringent. Dose, 2 to 6 grains.

Nitrate.—Astringent, tonic. Dose, 10 to 40 minims of the solution.

Phosphate.—Nervine tonic. Used chiefly in rickets. Dose, 3 to 10 grains.

Reduced Iron is a powerful blood tonic, but does not cause headache, constipation, or disorder of the stomach. Soon spoils except in pill. Dose, 2 to 6 grains.

Sulphate.—Powerful astringent and tonic, but apt to irritate the stomach. Dose, 1 to 4 grains.

Tartrate.—More astringent than lactate. Dose, 4 to 12 grains.

Tincture of the Perchloride (Steel Drops).—Tonic, astringent, checks bleeding. Dose, 10 to 20 drops.

Jalap.—A powerful watery purgative of great use in relieving congestion in all head diseases. Dose of the resin, 2 to 5 grains.

Compound Powder.—Dose, 10 to 40 grains. Is composed of 5 ounces jalap powder, 9 ounces cream of tartar, and 1 ounce ginger.

James's Powder.—(See ANTIMONY.) Dose, 2 to 6 grains.

Kino.—A strong astringent. Dose of the tincture, $\frac{1}{2}$ drachm to 2 drachms.

Laudanum (Tincture of Opium) is one of the most useful of all the various preparations of opium. Dose, 15 to 25 drops; 11 $\frac{1}{2}$ minims contain 1 grain of opium.

Lime Water.—A useful antacid in acidity and diarrhœa, used along with milk. It is made by throwing a piece of freshly burnt lime the size of a large apple into a bucket of soft water, and draining off the clear water in twelve hours or longer, which is then kept for use. Most useful in vomiting of infants.

Liquorice (Compound Powder of) consists of equal parts of liquorice root and senna with three parts of sugar. Dose, 30 to 60 grains.

Lobelia is a strong antispasmodic and expectorant, useful in asthma, but is dangerous and requires to be watched. Dose of the tincture, 10 minims to $\frac{1}{2}$ drachm.

Logwood.—A powerful astringent in diarrhœa. Dose, 1 to 2 ounces of the decoction.

Magnesia is a valuable antacid and aperient. Dose of any of the powders, 10 to 60 grains; of the fluid, 1 to 2 ounces.

Sulphate of Magnesia (Epsom Salts) is a good watery purgative, but must be freely diluted in cold water. When dissolved in little water it acts as a strong irritant. Dose, 60 grains to $\frac{1}{2}$ ounce.

Male Fern.—The best remedy for tapeworm. Dose, $\frac{1}{2}$ drachm to 2 drachms of the ethereal extract.

Mercury, Bichloride (Corrosive Sublimate).—Alterative. Used in some skin affections. Dose, $\frac{1}{16}$ grain in pill or solution.

Chloride (Calomel).—Mild purgative and alterative. Dose, 1 to 5 grains.

Grey Powder (Mercury and Chalk).—Alterative. Dose, 3 to 8 grains. When, after long use, any of the preparations of mercury begin to affect the system, the first sign is increased flow of saliva and tenderness of the gums. Mercury is very ill borne by scrofulous people, and should not be given in

diseases of the kidney. Children not unfrequently require the same doses as adults.

Mindererus' Spirit is Solution of Acetate of Ammonia (which see). Dose, a tablespoonful.

Morphia is the active principle of opium. It is less stimulating and more soporific or sleep-giving, but less anodyne or soothing than opium, and has the great advantage of not causing so much subsequent sickness. Like all preparations from opium, it should not be given to young children, or at least should be given with great caution. Dose of the acetate, hydrochlorate, or sulphate of morphia, $\frac{1}{8}$ to $\frac{1}{4}$, or even $\frac{1}{2}$ grain; of the solution, 15 to 30 minims. Each drachm contains $\frac{1}{2}$ grain of morphia (see also OPIUM).

Nitrous Ether, Spirit of (Sweet Spirits of Nitre), causes increased flow of urine, increased perspiration, and cooling of the body. Relieves some heart cases. Dose, $\frac{1}{2}$ drachm to 2 drachms in water.

Nux Vomica.—A bitter, aromatic tonic (the active principle is strychnine). Dose, $\frac{1}{2}$ grain to 1 grain of the extract; 5 to 10, or up to 30, drops of the tincture, to be given with great care and beginning with a small dose.

Opium is one of the most ancient and valuable of all drugs. It was called by the Arabs "*the gift of God*;" by the Greeks, "*the juice*." It is procured from a species of poppy which grows freely in the East; the unripe capsules of the poppy are scored with a knife in the morning, and the gummy exudation, which is opium, is collected. Like all things powerful for good, it is also powerful for evil, and has been, and is, much abused, having caused many deaths, especially of infants from its infamous misuse in the shape of soothing syrups, carminatives, etc. After prolonged use the system acquires tolerance of enormous quantities; as much as four hundred doses of laudanum has been taken

at one draught by an opium-eater. When taken continuously for any length of time the dose requires to be gradually increased in order to produce the same effect, and it is not uncommon for the person to acquire a craving for opium similar to that of a drunkard for drink, and with equally disastrous results (see De Quincey's "Confessions of an English Opium Eater"). When given in repeated doses the whole amount of any liquid preparations of opium or of morphia taken in four hours is to be considered as one dose, and of solid opium the whole amount taken in six hours is to be considered one dose; otherwise the effect has not time to pass off, and by repeating full doses at shorter intervals a poisoning action might be produced. Children are very easily affected by opium; hence it should be given to them with great caution, and beginning with very small doses—a third or less of the dose, according to the proportionate scale. In small doses opium is chiefly stimulant; in ordinary doses, first stimulant and then soporific or sleep-giving. It impairs appetite and digestion, diminishes all the secretions and excretions, except the perspiration, which is increased; it induces thirst and constipation, and is apt to leave considerable sickness and headache next day (see MORPHIA). In disease, it soothes pain and spasm, restrains discharges, allays irritability, and causes sleep. In chest affections it should not be given in full doses where there is much spit, or the spit might accumulate and cause suffocation, and in some cases it is hurtful from diminishing the spit.

Compound Ipecacuanha Powder (Dover's powder), one part of opium in ten. Dose, 3 to 12 grains.

Lead and Opium Pill.—Acetate of lead 36 grains, opium 6 grains, confection of roses 6 grains, 1 in 8. Dose, 4 to 8 grains. It must not be long continued, lest it give rise to lead poisoning.

Morphia.—The active principle of opium. Dose, 15 to 60 minims of the solution.

Opium.—Dose, $\frac{1}{4}$ to 3 grains.

Tincture of Opium Ammoniated, 1 grain in 96 minims. Dose, 15 minims to 1 drachm.

Tincture of Opium (Laudanum), 1 grain of opium in 14 $\frac{1}{2}$ minims. Dose, 4 to 10 minims to soothe cough, 15 to 25 to procure sleep.

Compound Tincture of Camphor (Paregoric Elixir), 1 grain of opium in $\frac{1}{2}$ oz. Dose, 15 minims to 1 drachm.

Ointment of Galls and Opium.—One part of opium in 14 $\frac{1}{2}$ of the ointment.

There are many other preparations of opium which may be used in similar doses.

Pancreatine.—Useful for digesting fat and oils. Dose, 2 to 6 grains.

Paregoric Elixir.—(See OPIUM.) Dose, 15 grains to 1 drachm.

Pepsin.—The gastric juice of the calf, or that of the pig, which is more powerful. Used in fevers and weak digestion. An overdose causes purging, which may be prevented by adding $\frac{1}{16}$ grain of morphia. Dose, 4 to 20 grains.

Phosphate of Iron.—Dose, 5 to 10 grains; of the syrup 1 drachm.

Phosphate of Quinine, Iron, and Strychnine (Syrup of).—Dose, 1 drachm, which contains 1 grain phosphate of iron, 1 grain phosphate of quinine, and $\frac{1}{32}$ grain strychnine.

Potash.—*Acetate*.—A valuable diuretic; increases the flow of urine. Dose, 10 to 60 grains.

Carbonate.—Antacid. Sedative to the stomach. Dose, 10 to 20 grains.

Bicarbonate.—Antacid, but not sedative. Dose, 10 to 30, or to 60 grains in acute rheumatism.

Chlorate.—Cooling, diuretic. Acts on the mucous membrane. Dose, 10 to 20 grains.

Citrate.—A diuretic which does not disturb digestion. Dose, 20 to 60 grains.

Nitrate (Saltpetre).—Cooling, diuretic, blood sedative. Dose, 5 to 30 grains.

Potassium Bromide.—Soothing. Dose, 5 to 30 grains; useful as a nerve sedative.

Potassium Iodide.—Depressing to the system; causes absorption of tumours and inflammatory products; removes mercury and lead from the system after they have been absorbed. Dose, 2 to 10 grains.

Prunes (Virginian).—Infusion, bark of American wild cherry $\frac{1}{2}$ ounce, water 1 pint. Sedative, but not depressing. Dose, 1 to 2 ounces.

Quassia.—The wood of a tree which grows in Jamaica. An excellent bitter tonic. Infusion is composed of quassia 60 grains, cold water 10 ounces. Dose of powdered wood, 10 to 20 grains; of the infusion—it does not keep long, and should be freshly made—1 to 2 ounces.

Quinine.—The active principle or alkaloid of Peruvian or Jesuits' bark. It is a simple bitter tonic and antiperiodic. Most valuable in malarious fevers. In large doses it reduces the temperature of the body. Dose as a tonic, 2 grains; as an antiperiodic, 2 to 10 grains. To reduce temperature, up to 20 grains. An overdose causes singing in the ears, partial deafness and blindness, when the absorption of what remains in the stomach should be at once checked by giving a cup of strong coffee. It should not be given when there is irritation of the stomach or bowels.

Citrate of Quinine and Iron.—An excellent tonic; it requires to be tightly corked, as it attracts moisture from the atmosphere. Dose, 5 to 10 grains.

Rhubarb.—An astringent, slightly bitter tonic purgative, of very disagreeable taste. Dose of the powdered root, 5 to 20 grains.

Compound Powder (Gregory's Powder).—Rhubarb 2 ounces, light magnesia 6 ounces, ginger 1 ounce. Is a valuable antacid and aperient, very valuable for children. Dose, 20 to 60 grains.

Salicin.—The alkaloid of willow bark. Useful in some diarrhoeas, in acute rheumatism, and in malarious fevers. Dose, 5 to 30 grains.

Salicylate of Soda.—Useful in acute rheumatism, and in small doses diminishes thirst in diabetes. Dose, 10 to 20 grains.

Santonin.—The alkaloid of a flower which grows in Russia. It causes yellow vision, and stains the urine yellow. It is used for round worms and thread worms. Dose, 2 to 6 grains.

Scammony.—A powerful purgative, acting chiefly on the mucous lining of the bowels. Dose, 5 to 10 grains.

Senna is a brisk purgative, acting chiefly on the small intestine. Given alone in full doses, it is apt to cause griping. Along with sulphate of magnesia (Epsom salts) and aromatics it forms the "black draught." Dose of the infusion (senna leaves 1 ounce, boiling water 10 ounces, infused for one hour), 1 to 2 ounces; of the tincture, $\frac{1}{2}$ drachm to $\frac{1}{2}$ ounce; of the syrup, 1 drachm.

Silver Nitrate.—Soothing in painful affections of the stomach and bowels, and restrains diarrhoea. It must not be used for a long time, as it stains the skin a leaden colour. Dose, $\frac{1}{8}$ to 1 grain in pill.

Soda (Bicarbonate).—A common baking powder. Antacid, diuretic. Dose, 10 to 40 grains.

Hypophosphite.—A nervine stimulant and tonic, best given in bitter infusions. Dose, 5 to 10 grains.

Tartrate (Rochelle Salt).—Diuretic and purgative. It is the basis of the common Seidlitz powder. Dose, 60 to 120 grains.

Squills.—The dried bulb of an onion-like plant

(*scilla maritima*). It is a powerful diuretic, and stimulating expectorant. Dose, 1 to 3 grains; 10 to 30 drops of the tincture, $\frac{1}{2}$ drachm to 2 drachms of the syrup.

Strychnia.—The active principle of *nux vomica*. Is a good bitter tonic to the stomach, and a nervine tonic. It is a powerful poison (which see), and accumulates in the body. When used for paralysis, whenever starting of the paralysed limb during sleep begins, the dose must at once be stopped for three days, and then begun again. Dose, $\frac{1}{24}$ to $\frac{1}{18}$ or $\frac{1}{12}$ grain.

Sulphate of Magnesia (Epsom Salts), a watery purgative, should be largely diluted. Dose, 60 grains to $\frac{1}{2}$ ounce.

Sulphur.—Alterative, diuretic, purgative. Dose, 20 to 60 grains.

Tar.—Diuretic, expectorant, stimulant. Useful in piles and some urinary diseases, as also in some cases of bronchitis. Dose, 4 to 16 grains.

Taraxacum.—The root of the common dandelion. Alterative, diuretic, laxative, with a special action on the liver. Dose, 5 to 10 grains of the extract, 1 to 2 drachms of the juice.

Turpentine.—Astringent, diuretic, stimulant. Dose, 10 to 60 drops. It must not be given when there is any affection of the kidney.

SECTION III.

REMEDIES ARRANGED ACCORDING TO THEIR EFFECTS.

Most remedies have more than one action, but usually only one very marked action. Some, however, have two or more marked actions, and hence are included in two or more separate lists.

Acids.—*Substances of a sharp sour taste and astringent action, and which turn vegetable blues to red.* See p. 440.

Alkalies.—*Substances which neutralise acids.*

Direct. Carbonates and bicarbonates of potash, soda, lithia, and magnesia, caustic soda, potash and lithia, lime water and carbonate of lime (chalk).

Direct but not remote on the urine.—Aromatic spirit, carbonate and solution of ammonia, wood and animal charcoal.

Remote Alkalies.—Acid and neutral salts of soda, potash, and lithia—as cream of tartar, acetate of soda, citrates of lithia and of soda.

Alteratives.—*Remedies which change diseased action by acting on the blood.*

Iodine.—Iodide of potassium (*glands*), iodide of sulphur (*skin*).

Mercury (*skin and mucous membrane*).—Blue pill, grey powder, calomel, iodides, corrosive sublimate.

Chlorine.—Chlorinated soda, chloride of lime.

Arsenic (*skin*).—Arsenious acid, arsenite of potash solution.

Antimony, sulphur, phosphorus, guaiacum (*skin*), taraxacum.

Anæsthetics.—*Substances which, when inhaled, destroy consciousness and cause insensibility to pain.* (Hence they are soporific, anodyne, and narcotic; but their effects are more immediate and less persistent than ordinary narcotics.)

Chloroform, ether, nitrous oxide.

Anodynes.—*Remedies which act on the nervous system, relieving pain and diminishing spasm.*

Soporifics and belladonna, atropia, stramonium, hyoscyamus, conium, aconite, digitalis, gelsemium.

Antacids.—*Substances which neutralise or prevent the formation of acids, and render the blood and secretions alkaline.*

Alkalies such as salts of potash (*kidneys*), soda

(liver), and lithia (kidneys); magnesia (purgative); lime (constipating), ammonia (skin and lungs), and charecoal (stomach).

Anthelmintics.—*Substances which destroy the life of worms in the bowel.*

Direct.—Tape worm : Oil of male fern, oil of turpentine, koussou, kamala, areca, pomegranate root bark. Round worm : Santonin, worm seed. Thread worm : Quassia, salt.

Indirect.—Scammony, calomel, jalap, gamboge, castor oil.

Worm Preventives.—Salts of iron, especially sulphate, quassia, nux vomica.

Antipyretics.—*Remedies which lower the temperature in fever.*

Quinine, alcohol, salicylic acid and its salts, chloral hydrate, aconite, digitalis, cold baths, bleeding, purgatives, blisters, antipyrin.

Antispasmodics.—*Medicines which allay spasm.*

Direct (Spinal Tonics).—Assafoetida, valerian. sumbul, turpentine, camphor, ammonia.

Indirect.—Conium, Indian hemp, bromide of potassium, salts of zinc, salts of silver, hydrocyanic acid, belladonna, stramonium, henbane, Indian hemp, opium, chloroform, ether.

Astringents.—*Medicines which cause contraction of the blood-vessels and diminution of the secretions.* All acids, especially gallic and sulphuric.

Oak bark, catechu, kino, logwood, tea, alum, chloride and nitrate of iron, oxide of zinc, acetate of lead, turpentine, creasote, ergot of rye.

Carminatives.—*Stimulants to the stomach, causing expulsion of flatulence, allaying pain and spasm.*

Ginger, capsicum (Cayenne pepper). cardamoms, mustard, horseradish, pepper, cinnamon, nutmeg, coriander, caraway, lavender, dill, anise. peppermint, juniper.

Demulcents.—*Substances which soothe and diminish irritation.*

Acacia, tragacanth, barley water, linseed tea, starch water, gum water, marsh mallow, honey, syrup, treacle, glycerine.

Depressants. See VASCULAR AND SPINAL SEDATIVES.

Diaphoretics.—*Medicines which cause increased action of the skin (insensible transpiration).*

Stimulant.—Acetate of ammonia, carbonate of ammonia, aleohol, camphor, sulphur, guaiacum, opium, warmth, hot vapour, warm drinks.

Sedative.—Tartar emetic, ipecacuanha.

Diuretics.—*Remedies which cause an increased flow of urine.*

Direct	{	<i>Stimulant</i> : Juniper, turpentine, alcohol.
		<i>Sedative</i> : Squill, tobacco, colchicum,
		salts of soda, potash, lithia, water.

Indirect.—Cream of tartar, watery purgatives, digitalis.

Prevent the formation of gravel (lithontriptic).—salts of lithia, potash, and soda, borax.

Emetics are agents which cause vomiting.

Direct.	Indirect.
Mustard, <i>rapid</i> .	Ipecacuanha.
Sulphate of zinc, <i>rapid</i> .	Tartar emetic.
Sulphate of copper.	Tickling the throat.
Carbonate of ammonia,	Lukewarm water.
<i>stimulant</i> .	

Common salt.

Expectorants.—*Medicines which encourage spit.*

Stimulant (chronic bronchitis).—Ammonia, carbonate of ammonia, squill, senega, balsams of Peru and tolu, assafoetida, larch bark, tar.

Sedative (fever).—Ipecacuanha, tartar emetic.

Vapours (very chronic bronchitis).—Steam, vapour of chlorine, ammonia, iodine, creasote, carbolic acid.

Narcotics.—*Medicines which act on the nervous system, soothing pain (anodyne), some causing direct sleep (soporific), and all producing stupor when the dose goes beyond a certain point (narcotic).*

Anodyne and Soporific.—Opium, morphia, chloral hydrate, croton chloral, Indian hemp, bromide of potassium.

Anodyne and Antispasmodic.—Belladonna, atropia, stramonium, hyoscyamus.

Anodyne.—Conium, aconite, digitalis.

Purgatives.—*Medicines which cause increased action of the bowels, with more or less alteration in the character of the stools.*

Laxatives cause increased movement of the bowels and slight softening of the stools. Figs, prunes, honey, treacle, manna, sulphur, *gentle stimulant*; olive oil, melted butter, castor oil, *moderate action, operate quickly in two to three hours*; magnesia, *soothing, does not increase secretion*, carbonate of magnesia. (These are successively stronger from the head of the list.)

Simple Purgatives.—Rhubarb, *tonic in small doses: slow, mild, acts on the whole bowel, subsequently astringent*. Senna causes griping and contraction, especially of the small bowel. Aloes, *tonic in small doses, slow, 8 to 24 hours; acts chiefly on the large bowel, without much increasing the secretion*.

Drastic Purgatives, irritant, and cause increased secretion.—Jalap, *copious, liquid stools, sometimes griping*. Scammony, *irritant, acting chiefly on the mucous membrane*. Colocynth, *irritant, stimulant, diuretic, acting chiefly on the large bowel*. Croton oil, *strong irritant, depressing, profuse watery stools, very speedy, half an hour, uncertain*. Gamboge, *very irritant, diuretic, depressing, watery stools*. Podophyllin, *irritant, griping, diuretic, uncertain*.

Hydragogue Purgatives, cause watery stools.—

Jalap, gamboge, elaterium, *very irritant*. Cream of tartar, *diuretic*.

Saline.—Sulphate of magnesia, *well diluted, is mild and safe diuretic*, cream of tartar, tartrate of soda (Seidlitz powder), citrate of magnesia, phosphate of soda.

Cholagogue, increase the secretion of bile.—Grey powder, blue pill, calomel, aloes, podophyllin.

Sedatives.—*Remedies which allay pain, depress action, and diminish function.*

1. *Spinal*.—Conium, bromide of potassium, bromide of ammonium, Calabar bean, hydrocyanic acid.

2. *Vascular (Blood)*.—*a. Chiefly the heart*.—Digitalis, hellebore, tobacco, aconite, colchicum, hydrocyanic acid, Calabar bean.

b. Chiefly the smaller vessels.—Tartar emetic, nitrate of potash, acetate of lead, ipecacuanha, ergot, nitrite of amyl.

Pulmonary (Lungs).—Opium, morphia, conium, belladonna, stramonium, hydrocyanic acid, acetate of lead, smoke or vapour of tobacco, stramonium, conia, hydrocyanic acid.

Stomach.—Dilute hydrocyanic acid, subnitrate, carbonate, and oxide of bismuth, nitrate of silver, oxalate of cerium, creasote, carbolic acid, carbonates of soda and potash, belladonna, stramonium, hyoseyamus, opium.

Soporifics.—See NARCOTICS.

Stimulants.—*Remedies which excite action and increase function.*

Aromatic ammonia (sal volatile), carbonate of ammonia, alcohol, ether, aromatic volatile oils (such as peppermint, camphor water, etc.), tea, coffee, cocoa, extract of beef, etc., small doses of opium.

Spinal.—Strychnia, nux vomica, cantharides, phosphorus.

Vascular (Blood).—*a. Heart*.—Ammonia, alcohol,

ether, turpentine, aromatic oils, camphor, assafœtida, valerian, sumbul.

b. Smaller vessels.—Acetate and citrate of ammonia, guaiacum.

Pulmonary.—See EXPECTORANTS.

Stomach.—See CARMINATIVES.

Sudorifics.—*Remedies which cause increased action of the skin (perspiration);* same remedies that are given under DIAPHORETICS.

Warm drinks, Dover's powder, carbonate of ammonia, ipecacuanha wine, and alcohol.

Tonics.—*Remedies which give tone to the system and improve the general health.*

Blood.—Salts of iron, especially reduced iron, cod liver oil, other oils, fresh air, light, exercise.

Blood-vessels.—Salts of iron, digitalis, acids, and astringents. Nerve, stomach, and blood tonics.

Nervine.—Cinchona bark and its alkaloids, quinine, etc., arsenic (*antiperiodics*); nux vomica, strychnia, nitrate and oxide of silver, sulphate and oxide of tin, sulphate of copper, salts of iron.

Stomach Tonics.—Calumba, gentian, quassia, hops, mineral acids, strychnia, quinine, iron, pepsin, oxgall, pancreatin, aloes, rhubarb, taraxacum.

General Tonics.—Salts of iron, quinine, quassia, calumba; sunlight, fresh air, exercise.

INDEX.

	PAGE
ABSCCESS	388
— of brain	144
— of liver	332
Accidents	387
Acids	440
Acne	362
Acute specific diseases	62, 88
Addison's disease	237
Aged	386
— bronchitis of	256
— cataract of	214
— constipation of	322
— dementia of	199
— pneumonia of	266
Ague	94
— brass founders'	403
Ague-cake	95, 236
Air	12, 28, 126, 127
— a food	275
Albumen, test for	352
Albuminous stools	313
— urine	345
Alcohol	6, 32, 52, 400, 417
Alkalies	457
Alteratives	157
Amorphoid degeneration	333, 345
Anæmia	125, 187, 295
Anæsthetics	457
Anasarca	128, 228
Aneurism	232
Angina Pectoris	228
Anodynes	457

	PAGE
Antacids	457
Anthelmintics	458
Antipyretics	458
Antiseptics	20, 28, 421
Antispasmodics	458
Aorta	225
Aphonia (loss of voice)	242, 246
Aphthæ (thrush)	384
Apoplexy	148
— of spine	155
Arteries	23, 232
— tying of	389
Arthritis, osteo-	113
Ascites	339
Asthma	260
— hay	253
Astigmatism	218
Astringents	458
Atheroma	231
Atrophy (wasting)	148, 161, 162, 332, 386
Aura epileptica	172, 176
Auscultation	252
BACK, pain in	34, 105, 154, 344
Bald spots	367
Bathing	8, 30, 241, 373
Baths	30, 427
Bed	29
— clothes	29
— room	20, 28
— sores	30
— wetting	350
Beef tea	32, 52
Belly, pain in	310, 314, 316, 321, 338, 344
— swollen	89, 316, 339, 340
Beri-beri	128
Bile	292, 302, 332, 334
— acids	332
Biliousness	302
Bites	100, 416
Bladder	30, 351

						PAGE
Bleeding from arteries	...	...	...	...	...	389
— bladder	...	...	...	...	...	348
— bowels	...	...	...	...	...	316
— ear	...	...	...	...	...	224
— lungs	...	...	...	...	...	263
— nose	...	...	...	...	...	211
— piles	...	...	...	...	...	330
— stomach	...	...	...	...	...	307
— wounds	...	...	...	...	...	389
Blindness	...	...	...	...	...	214
— colour	...	...	...	...	...	218
— night	...	...	...	...	...	218
Blisters	...	...	...	...	...	429
Blood-letting	...	...	...	...	...	429, 433
Boils	...	...	...	...	...	364
Bones, broken	...	...	...	...	...	392
Bowels, confined	...	...	...	9, 311,	316,	392
— pain in	...	...	...	...	310,	321
— prolapse of	...	...	...	...	...	331
— relaxed	...	...	...	310,	313,	382
Brain	...	...	...	...	...	135
— tumour of	...	...	...	...	...	148
Breast, cancer of	...	...	...	...	...	114
— hysterical	...	...	...	...	...	184
— irritable	...	...	...	...	...	191
— pang	...	...	...	...	...	228
Breathing, artificial	...	...	...	...	...	397
— difficult	...	178,	228,	246,	254,	260, 338
— natural	...	...	...	...	26,	252
Bright's disease	...	...	...	...	...	341
Bronchiectasis	...	...	...	...	...	259
Bronchitis, acute	...	...	...	...	...	255
— chronic	...	...	...	...	...	256
Bronchocoele	...	...	...	...	...	235
Brow ague	...	...	...	...	...	189
Bruises	...	...	...	...	221,	390
Bunions	...	...	...	...	...	363
Burns	...	...	...	...	...	390
CACHEXIA	...	...	...	...	...	113
Calcareous degeneration	...	...	...	...	231,	377

					PAGE
Calculus (stone)	...	...	...	336, 344,	352
Camp fever	...	...	...	...	51
Cancer	...	...	...	...	113
— of liver	...	...	...	...	333
— — stomach	...	...	...	...	308
Cancrum oris	...	...	...	...	283
Carious teeth	...	...	...	...	284
Carminatives	...	...	...	...	458
Casts in urine	...	...	...	...	345
Cataract	...	...	...	...	214
Catarrh	...	...	...	...	238
Caustics	...	...	...	...	432
Cercbro-spinal fever	...	...	...	...	49
Chafing	...	...	...	...	380
Chemosis	...	...	...	...	204
Chest, diseases of	...	...	...	...	254
Chicken pox	...	...	...	...	41
Chilblains	...	...	...	...	365
Child-crowing	...	...	...	...	178
Children, diseases of	...	...	...	...	380
— management of	...	...	...	...	373
Chloroform	...	...	...	...	444
Chlorosis	...	...	...	...	126
Choking	...	...	178, 244, 247, 260,	...	391
Cholera, Asiatic	...	...	...	...	76
— — prevention of	...	...	...	...	78
— British	...	...	...	...	75
Chorea	...	...	...	...	180
Chronic abscess	...	...	...	...	389
— bronchitis	...	...	...	...	256
— gout	...	...	...	...	110
— pleurisy	...	...	...	...	281
— rheumatism	...	...	...	...	107
— sore throat	...	...	...	244,	288
— ulcer of the stomach	...	...	...	...	306
Chyle	...	...	...	...	293
Chyme	...	...	...	...	291
Circulation	...	...	...	...	225
Cirrhosis of liver	...	...	...	...	332
— — lungs	...	...	...	264,	271
Cleanliness	...	...	...	20, 30,	373

	PAGE
Climate	125, 279
Clinical thermometer	25
Clothing	9, 29, 374
Cocoa	3
Cod liver oil	123, 278, 341, 445
Coffec	3, 461
Cold	19
— bathing	7, 427
— in the bowels	321
— — chest	254
— — head	239
— — throat	242
Colic	321, 344
— copper	404
— lead	404
Colliquative sweating	28, 270
Coma (morbid drowsiness) 133, 141, 145, 332, 336, 349	
Compress	301, 307
Concussion	152
Congestion	149, 238, 265, 334
Conjunctivitis	203
Constipation	9, 28, 311, 316, 322
Constitution	16, 274
Consumption	268
— of the bowels	340
Contagion	19
Continued fever	27
Convalescence	34, 43, 54, 87
Convulsions	169, 380
Corneitis	211
Corns	363
Coryza	239, 403
Cough	34, 43, 65, 243
— from bowels	328
— — lungs 255, 257, 260, 262, 266, 272, 274, 280	
— — stomach	301
— hysterical	185
— teething	379
— throat	243, 245, 247
— tonsils	288
— whooping	65

						PAGE
Cow-pox	...	...	...	...	...	39
Cramp	...	...	...	...	...	76, 177
Cretinism	...	...	...	...	...	120
Crisis	...	...	...	...	...	28
Croup	...	...	...	...	...	246
Cupping	...	...	...	...	...	430
Cuts	...	...	...	...	...	392
Cystitis	...	...	...	...	...	351
DAMP	...	...	12, 107, 124, 177, 239,	313		
Deafness	...	...	...	...	...	223
Degenerations	...	...	...	...	...	275
Delirium	...	...	...	...	...	30
— tremens	...	...	...	...	...	400
Dementia	...	...	...	...	...	195
Demulcents	...	...	...	...	...	458
Dengue	...	...	...	...	...	61
Depressants	...	...	...	...	...	458
Depression of spirits	124, 127, 186, 195, 293, 300,	322				
Derbyshire neck	...	...	...	...	...	235
Desquamation	...	...	...	21, 43, 46, 61,	62	
Diabetes	...	...	...	...	...	121
— insipidus	...	...	...	...	...	123
Diarrhœa	...	...	...	54, 310,	382	
Diathesis, hæmorrhagic	...	...	...	...	...	123
— lithic	...	...	...	...	...	342
— oxalic	...	...	...	...	...	343
— phosphatic	...	...	...	...	...	343
Diet	...	...	...	276, 290, 304,	375	
Digestion	...	...	...	...	...	291
Diphtheria	...	...	...	...	...	70
Discharge critical	...	...	...	...	...	28
— from abscess	...	...	...	...	...	388
— — bladder	...	...	...	...	...	351
— — bowels	...	...	...	...	318,	382
— — ear	...	...	...	...	...	224
— — eye	...	...	...	...	207,	209
— — nose	...	...	...	...	239,	241
— — throat	...	...	...	...	70,	287
— — wounds	...	...	...	...	...	395
Disease, nature of	...	...	...	...	...	15

	PAGE
Disease, origin of	15
— type of	16
Disinfectants	18, 421
Disinfection	21, 22, 421
Dislocations	392
Disorders of intellect	192
Diuretics	159
Dizziness	300, 413
Doses	419
Drains	12
Draughts	29, 106, 238
Dress	8, 374
Drink	3, 5, 32
Dropsy	128, 228, 265, 346
— of belly	339
— — eyelids	207
— — limbs	126
— — windpipe	244
Drowning	396
Dwellings	12
Dysentery, acute	312, 383
— chronic	314
Dyspepsia	289
EAR	222
— bleeding from	224
— discharge from	224
— inflammation of	223
— pain in	222, 287
Earache	222
Ecthyma	361, 372
Eczema	360, 371
Electricity	161, 163, 166
Emaciation 126, 261, 272, 314, 333, 341, 347, 383,	387
Emetics	33, 459
Emphysema	262
Empyema	282
Encephalitis	138
Endocarditis	227
Enema	312, 315, 317
Enteric fever	53

							PAGE
Enteritis	...	...	...	...	...	...	103
Enuresis	...	...	...	...	...	...	350
Ephemera	...	...	...	...	...	...	91
Epidemics	...	...	...	...	16, 44, 60, 80,	...	81
Epilepsy	...	...	...	...	...	...	171
Epithelioma	...	...	...	...	...	...	115
Eructations	...	...	...	...	...	300,	311
Eruptions	...	...	...	...	60,	354,	367
Erysipelas	...	...	...	...	...	...	62
Erythema	...	...	...	...	...	...	354
Eustachian tube	...	...	...	...	...	...	222
Exercise ...	...	...	...	...	7, 126,	324,	365
Expectorants	...	...	...	...	...	...	459
External remedies	...	...	...	...	...	...	421
Eye, diseases of	...	...	...	...	...	...	200
— structure of	...	...	...	...	...	...	201
Eyelashes	...	...	...	...	...	...	221
Eyelids	...	...	...	...	...	...	220
— granular	...	...	...	...	...	...	210
FACE-ACHE	...	...	...	...	...	...	189
Fainting	...	...	...	...	...	...	392
Faith	...	...	...	...	...	...	11
Falling fits	...	...	...	...	...	...	171
Famine fever	...	...	...	...	...	...	73
Farcy	...	...	...	...	...	...	98
Farinaceous food	...	...	...	...	...	...	290
Fatigue	...	...	...	...	...	...	7
Fatty degeneration	...	...	...	...	...	...	377
— heart	...	...	...	...	...	...	227
— liver	...	...	...	...	...	...	333
Favus	...	...	...	...	...	367,	372
Fevers, classes of	...	...	...	...	...	...	27
— general treatment of	...	...	...	...	...	...	28
— infectious	...	...	...	...	...	62,	88
— malarious	...	...	...	...	...	92,	94
— simple	...	...	...	...	...	27,	91
Filters	...	...	...	...	...	...	4
Fireplace	...	...	...	...	...	13,	29
Fish	...	...	...	...	...	...	304
— poisonous	...	...	...	...	...	...	416

						PAGE
Fits ... ..	...	...	...	...	...	148, 169, 171, 183
Flatulence ... ..	...	...	...	...	...	299, 311, 321, 335, 382
Foods ... ..	...	...	...	...	...	2, 31, 275, 289
Foreign bodies in eye...	...	...	...	...	...	212
Fractures ... ..	...	...	...	...	...	392
Freckles ... ..	...	...	...	...	...	364
Fresh air ... ..	...	...	...	...	...	126, 127, 278, 374
Friction ... ..	...	...	...	...	...	106, 163, 325, 374
GALL (bile) ... ..	...	...	...	...	...	292, 302
— stone ... ..	...	...	...	...	...	336
Galvanism ... ..	...	...	...	...	...	285
Gargles ... ..	...	...	...	...	...	432
Gastric fever ... ..	...	...	...	...	...	53
— juice ... ..	...	...	...	...	...	293
Gatherings ... ..	...	...	...	...	...	388
German measles ... ..	...	...	...	...	...	50
Germes ... ..	...	...	...	...	...	15, 16, 17, 20, 294, 296
Giddiness ... ..	...	...	...	...	...	300, 310, 409
Glanders ... ..	...	...	...	...	...	97
Globus hystericus ... ..	...	...	...	...	...	183
Goitre ... ..	...	...	...	...	...	235
— exophthalmic ... ..	...	...	...	...	...	236
Gout, acute ... ..	...	...	...	...	...	108
— atonic ... ..	...	...	...	...	...	111
— chronic ... ..	...	...	...	...	...	110
— retrocedent ... ..	...	...	...	...	...	111
Granular lids ... ..	...	...	...	...	...	210
Gravel ... ..	...	...	...	...	...	342
Grease ... ..	...	...	...	...	...	98
Green sickness ... ..	...	...	...	...	...	126
Grin, sardonic ... ..	...	...	...	...	...	168
Gripping ... ..	...	...	...	...	...	313, 382
Gumboil ... ..	...	...	...	...	...	285
HEMATEMESIS ... ..	...	...	...	...	...	307
Hæmaturia ... ..	...	...	...	...	...	348
Hæmoptysis ... ..	...	...	...	...	...	263
Hæmorrhagic diathesis ... ..	...	...	...	...	...	123
Hæmorrhoids ... ..	...	...	...	...	...	329

						PAGE
Hair, diseases affecting	...	...	...	...	...	366, 367
Headache	...	...	...	...	138,	144, 145
— from biliousness	...	...	...	...	...	309
— — bloodlessness	...	...	...	...	...	126
— — congestion	...	...	...	...	...	33
— — constipation	...	...	...	...	...	322
— — epilepsy	...	...	...	...	...	173
— — fever	...	...	...	...	...	33
— — impure air	...	...	...	...	...	409
— hysterical	...	...	...	...	...	183
— rheumatic	...	...	...	...	...	105
— sick	...	...	...	...	...	189
— stomach	...	...	...	...	...	300
Health, preservation of	...	...	...	...	2,	375
Heartburn	...	...	...	...	...	300
Heart, diseases of	...	...	...	...	...	227
— structure of	...	...	...	...	...	225
Heat	...	...	...	...	...	18
— in bowels	...	...	...	...	...	313
— of body	...	...	25,	58,	103,	266, 280
— — inflammations	...	...	...	...	388,	395
— — skin	...	...	...	...	62,	361
— — toc	...	...	...	...	...	109
Hectic fever	...	...	...	...	28,	272
Hemiplegia	...	...	...	...	...	158
Hernia	...	...	...	...	...	316
Herpes	...	...	...	...	359,	371
Hiccough	...	...	...	...	...	34
Hoarseness	...	...	...	212,	245,	247
Hydatids	...	...	...	...	...	333
Hydrocephalus, acnte	...	...	...	...	...	140
— chronic	...	...	...	...	...	147
— spurious	...	...	...	...	...	142
Hydrophobia	...	...	...	...	...	100
Hypermetropia	...	...	...	...	...	217
Hypertrophy	...	...	...	...	148,	228
Hypochondriasis	...	...	...	...	...	195
Hysteria	...	...	...	...	...	182
ICE	...	...	...	...	...	32
Ichthyosis	...	...	...	...	...	358

	PAGE
Icterus (jaundice)	334
Idiocy	199
Incised wounds	392
Incontinence of urine	350
Indigestion	289
Infantile convulsions	169, 380
— paralysis	162
— remittent fever	53
Infants, diseases of	380
— feeding of	375
— management of	373
Infection	19
Inflammation of belly	338
— — bladder	351
— — bowels	309
— — brain	143
— — — membrane	138
— — ear	223
— — eye	203, 204
— — cyclids	220
— — gullet	289
— — heart	227
— — kidney	345, 348
— — lungs	264
— — mouth	283
— — pericardium	227
— — pleura	279
— — skin	62, 360
— — spinal cord	154
— — stomach	305
— — throat	246, 288
— — tongue	285
— — tonsils	286, 288
— — veins	233
— — wounds	395
Influenza	80
Inhalation	244, 259, 260, 279
Injections	312, 315, 317
— subcutaneous	169, 197, 438
Insensibility from apoplexy	148, 150
— — concussion	152

						PAGE
Insensibility from drowning	...	...	...	...	...	396
— — epilepsy	...	...	...	...	172,	195
— — fainting	...	...	...	...	...	393
— — gas poisoning	...	...	...	...	...	409
— — intoxication	...	...	...	...	153,	414
— — opium poisoning	...	...	...	...	153,	415
Inspiration, artificial	...	...	...	...	...	396
Intellect, disorders of	...	...	...	...	...	192
Intercostal neuralgia	...	...	...	...	...	190
Intermittent fever	...	...	...	...	28,	94
Internal remedies	...	...	...	...	...	440
Intussusception	...	...	...	...	...	316
Inward fits (flatulence)	...	...	...	...	...	382
Ipecacuanha	...	...	...	...	...	448
Iritis	...	...	...	...	...	213
Itch	...	...	...	...	367,	371
Itching	...	...	109,	355,	356,	357,
					358,	360
JAIL fever	...	...	...	...	...	51
Jaundice	...	...	...	...	...	334
Joints, gouty	...	...	...	...	108,	110,
— hysterical	...	...	...	...	...	184
— rheumatic	...	...	...	...	...	103
KELOID	...	...	...	...	...	368
Keratitis	...	...	...	...	...	211
Kidney, Bright's disease of	...	...	...	...	...	344
— colic	...	...	...	...	...	344
— inflammation	...	...	...	...	315,	348
LARYNGISMUS stridulus	...	...	...	...	...	178
Laryngitis	...	...	...	...	...	242
Laryngotomy	...	...	...	...	...	246
Lead colic	...	...	...	...	...	404
Leeches	...	...	...	...	...	433
Lepra	...	...	...	...	...	358
Leprosy	...	...	...	...	...	117
Lichen	...	...	...	...	356,	369
Ligaturing arteries	...	...	...	...	...	389
Light	...	...	...	...	29,	205
Lime juice	...	...	...	...	...	125

							PAGE
Liniments	...	...	...	...	...	...	434
Liver	...	...	...	...	...	...	332
— spots	...	...	...	...	...	...	367
Lockjaw	...	...	...	...	...	...	166
Locomotor ataxy	...	...	...	...	...	...	159
Loins, pains in	...	...	...	...	105,	344,	348
Loose bowels	...	...	...	...	...	318,	382
Lotions	...	...	...	...	...	...	434
Lumbago	...	...	...	...	...	...	105
Lumbrici (round worms)	...	...	...	...	...	...	326
Lungs, inflammation of	...	...	...	...	...	...	261
— tubercle in	...	...	...	...	...	...	268
Lupus	...	...	...	...	...	...	116
Lymph, vaccinc	...	...	...	...	...	...	39
MADNESS	...	...	...	...	...	...	193
Malaria (marsh miasma)	...	...	...	...	92,	94,	188
Malignant pustule	...	...	...	...	...	...	99
Mania	...	...	...	...	...	...	193
Mastodynia	...	...	...	...	...	...	191
Materia medica	...	...	...	...	...	...	418
Mattress	...	...	...	...	...	9,	29
Meals	...	...	...	...	2,	303,	375, 387
Measles	...	...	...	...	...	...	43
Measures	...	...	...	...	...	...	419
Medicines	...	...	...	...	...	9,	440
— actions of	...	...	...	...	...	...	456
Medullary cancer	...	...	...	...	...	...	115
Megrims	...	...	...	...	...	...	189
Melancholia	...	...	...	...	...	...	194
Meningitis	...	...	...	...	...	...	138
— tubercular	...	...	...	...	...	...	140
Mental depression	...	126,	127,	186,	195,	300,	306
Metastasis	...	...	...	...	...	103,	111
Miasma	...	...	...	...	...	92,	94, 188
Milk	...	...	...	...	...	...	3
— diet	...	...	...	...	...	...	152
— leg	...	...	...	...	...	...	234
Mineral poisons	...	...	...	...	...	403,	107
Moderation in diet	...	...	...	...	...	...	375
Molluscum	...	...	...	...	...	...	368

						PAGE
Monomania						194
Mother's milk						277, 375
Mouth, diseases of						283, 285, 384
Mumps						64
Muscles						105, 169, 173
Muscular atrophy						161
— rheumatism						105
Myocarditis						227
Myopia						215
NARCOTICS					12, 415, 451, 460	
Nausea					310, 322, 393	
Neck, crick in						106
— swelling of					61, 118, 240	
Nephritis						348
Nervous system						128
Nettle rash						355
— stings						416
Neuralgia						188
Nodding spasm						177
Nose, bleeding from						241
— cold in						241, 253
Nursing						21, 29
OBSTRUCTION of bowels						316
Œdema					126, 228, 244, 267	
— glottidis						244
Œsophagitis						289
Ointments						435
Old age						386
Ophthalmia, catarrhal						204
— gonorrhœal						209
— neonatorum						209
— purulent or contagious						207
— pustular or strumous						205
Opium					415, 449, 451	
Osteo-arthritis						113
— malacia						120
Overloading the stomach					295, 377, 384	
Ozæna						241

						PAGE
PAIN all over ...	...	...	...	...	120,	255
— in the anus	...	...	...	...	313,	330
— — back ...	...	...	...	...	...	105
— — belly	...	...	...	...	337,	338
— — bladder	...	...	...	...	351,	352
— — bowels	...	...	55,	310, 313,	316,	321
— — breast	...	...	...	114,	184,	191
— — chest	...	...	...	190,	256,	266
— — ear ...	...	...	...	222,	223,	287
— — eye ...	...	...	...	204,	205,	211, 213
— — face ...	...	...	...	...	...	188
— — finger	...	...	...	...	...	395
— — glands	...	...	...	...	64,	286
— — groin	...	...	...	...	...	318
— — gullet	...	...	...	...	...	289
— — heart	...	...	...	...	...	228
— — joints	...	...	61,	103, 107,	109,	184
— — limbs	...	...	...	...	73,	119
— — liver ...	...	...	...	...	333,	337
— — loins ...	...	...	...	105,	344,	346
— — lungs	...	...	...	255,	266,	280
— — mouth	...	...	...	...	...	283
— — navel	...	...	...	...	311,	321
— — neck ...	...	...	...	...	...	70
— — side ...	...	...	...	...	106,	280
— — skin ...	...	...	...	62,	364,	365
— — spine	...	...	...	...	153,	185
— — stomach	...	...	...	299,	305,	306, 308
— — teeth	...	...	...	...	...	284
— — thigh	...	...	...	...	...	190
— — throat	...	...	...	...	70,	286
— — toe ...	...	...	...	...	...	109
— — tongue	...	...	...	...	...	285
— — tonsils	...	...	...	...	...	286
— — veins	...	...	...	...	...	233
Pains, flying ...	...	...	...	...	106,	272
— wandering	...	...	...	...	...	106
Painters' colic ...	...	...	...	...	...	404
Palpitation ...	...	...	...	...	229,	300
Palsy ...	...	...	...	...	...	157
— progressive	...	...	...	...	161,	166

	PAGE
Palsy, scriveners'	165
— shaking	164
— wasting	161
Pancreatin	292
Paracentesis abdominis	340
— thoracis	282
Paralysis	157
— agitans	164
— facial	163
— glossopharyngeal	166
— infantile	162
— local	163
— of insane	195
Paralytic stroke	158
Paraplegia	157
Pemphigus	359
Percussion	252
Perforation of bowel	55, 337
— — eye	208, 212
— — stomach	306
— — tympanum	223
Peritoneum	338
Peritonitis	338
Pharyngitis	288
Phlebitis	233
Photophobia	205
Phthisis	268
Piles	329
Plague	70
Pleurisy, acute	279
— chronic	281
Pleurodynia (false pleurisy)	106
Pneumonia	264
Pneumothorax	282
Poisoning, acute, by	
Acids	407
Alkalies	408
Animal poisons	416
Gases	248, 408
Metals	410
Minerals	411

					PAGE
Poisoning, acute, by					
Convulsives (<i>e.g.</i> strychnia)	...	...	...	...	412
Deliriants (<i>e.g.</i> belladonna)	...	...	...	...	412
Depressants (<i>e.g.</i> hemlock)	...	...	...	...	413
Inebriants (<i>e.g.</i> alcohol)	...	...	...	...	414
Irritants (<i>e.g.</i> laburnum)	...	...	...	...	414
Narcotics (<i>e.g.</i> opium)	...	...	...	...	415, 460
Poisoning, chronic, by					
Inorganic poisons	...	...	...	...	403
Organic poisons	...	...	...	...	400
Poultices	...	...	...	...	437
Precautions	...	...	...	...	20
Presbyopia	...	...	...	...	216
Prevention of colds	...	...	...	...	240
— — — consumption	...	...	...	...	276, 277
— — — fevers	...	...	...	...	20, 21, 78, 86
— — — infection	...	...	...	...	20
Progressive muscular atrophy	...	...	...	...	161
Prolapse of bowel	...	...	...	...	331
Prurigo	...	...	...	...	357
Psoriasis	...	...	...	...	358
Puerperal ephemera	...	...	...	...	91
— fever	...	...	...	...	89
Pulse	...	...	...	...	24
Purgatives	...	...	...	...	10, 414, 460
Purging	...	...	...	...	318
Purpura	...	...	...	...	123
Pus	...	...	...	...	35, 63, 388
Pustule	...	...	...	...	35, 99, 361, 372
Pyæmia	...	...	...	...	87
QUACK medicines	...	...	...	...	10
Quartan ague	...	...	...	...	95
Quinine	...	...	...	...	89, 92, 96, 191
Quinsy	...	...	...	...	286
Quotidian ague	...	...	...	...	95
RANULA	...	...	...	...	286
Rash	...	...	...	...	60, 355, 383
Red gum	...	...	...	...	357, 383
Reflex action	...	...	...	...	132

					PAGE
Relapsing fever	...	...	...	...	73
Remittent fever	...	...	...	...	92
Residence	...	...	...	...	12
Respiration, artificial	...	...	...	397, 409, 414	
— natural	...	...	...	27, 250, 272	
Retention of urine	...	...	...	...	343
Re-vaccination	...	...	...	...	40
Rheumatic fever	...	...	...	...	102
Rheumatism	...	...	...	...	105
Rickets	...	...	...	...	119
Rigors	...	...	...	27, 81, 92, 94,	280
Ringworm	...	...	...	...	366, 372
Rodent ulcer	...	...	...	...	116
Roseola	...	...	...	...	355, 370
Rötheln	...	...	...	...	50
Running from ears	...	...	...	...	224
— — eyes	...	...	...	...	204
— — nose	...	...	...	...	241
Rupia	...	...	...	...	360
Rupture	...	...	...	...	316
SALAAM convulsions	...	...	...	...	177
Saliva	...	...	...	...	290
Salivation	...	...	...	...	285
Salt injections	...	...	...	...	328
Sand in the eye	...	...	...	204, 207,	212
Scabies	...	...	...	...	367, 371
Scalds	...	...	...	...	390
Scarlatina	...	...	...	...	46
Scarlet fever	...	...	...	...	45
Sciatica	...	...	...	...	190
Scirrhus	...	...	...	...	114
Sclerotitis	...	...	...	...	213
Scorbutus	...	...	...	...	124
Scrofula	...	...	...	...	117
Scurvy	...	...	...	...	124
Sea-sickness	...	...	...	...	394
Sedatives	...	...	...	...	461
Sedentary occupations	...	...	...	7,	278
Seizure, epileptic	...	...	...	...	172
Septicæmia	...	...	...	...	88

	PAGE
Sewer gases	13, 73
Shingles	359
Shivering	27, 81, 92, 94, 280
Shock	390
Sickness	308, 322, 394
Sick-room	20, 28
Sight, long	216
— short	215
— weak	217
Skin diseases	354
Sleep	9, 377
Sleeplessness	33, 379
Small-pox	31
Smoking	298
Softening of the brain	144
Soothing medicines	12
Soporifics	4
Sore mouth	283, 384
— throat	212, 286, 288
Sores	392
Spasm	134
Spina bifida	156
Spinal cord	135, 153
Spine	153, 185
Spit	217, 255, 266
Spleen	95, 237
Sponging the body	30
Sprains	394
Squinting	218
Stiff neck	106
Stimulants	52, 461
Stings	416
Stomatitis	283
Stone in the bladder	352
— — kidney	344
— — liver	336
Stools	310, 313, 382, 383, 406
Struma	417
Stupor	138, 140, 336, 319
Sty	221
Subcutaneous injection	169, 197, 438

					PAGE	
Tracheotomy					179, 245,	249
Tubercle					140, 268,	333
Tympanites					34,	338
Tympanum ... ..					...	222
Typhlitis ... ..					...	311
Typhoid fever ... ..					...	53
Typhus fever ... ..					...	51
ULCERS of bowels					55,	315
— — — cornea					207,	211
— — — mouth ... ..					...	283
— — — stomach ... ..					...	306
— — — tongue ... ..					...	286
— — — windpipe ... ..					...	244
Uræmia ... ..					...	349
Urinary sediments ... ..					...	342
Urine ... ..					...	352
— albuminous ... ..					...	345
— bloody ... ..					...	348
— incontinence of ... ..					...	350
— pus in					348,	351
— retention of ... ..					...	349
— suppression of ... ..					...	349
— tests for					124,	352
Urticaria					355,	370
VACCINATION ... ..					...	38
Varicella ... ..					...	41
Varicose veins					234,	330
Variola ... ..					...	31
Ventilation					12, 29,	254
Voice, loss of ... ..					...	242, 245
Vomiting					34, 138, 140,	384
— of bile ... ..					...	75, 309
— — blood ... ..					...	307
WARM baths					373, 381,	428
Warmth					9, 325,	387
Warts	364
Water brain fever	140
— brash	300

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